RAILROAD GAZETTE

FRIDAY, SEPTEMBER 13, 1878.

Contributions.

The Paris Exhibition—Austrian Exhibits—Lubrication of Wheel Flanges.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Austria has, since her Vienna Exhibition, understood the real value and the chief object of an international exhibition, and thus set an example which, it is to be hoped, will be followed hereafter by other countries. Most people believe that only new inventions, or some special objects that have not yet been presented to the public at large, or products that may effect an international commerce, are the only things worthy of being represented at a great exhibition. Although nobody doubts the value of calling public attention to a new idea or an invention, immediately after its creation—even when such idea or invention has not yet been practically tested—it is, in my opinion, of equal if not of greater importance to collect and exhibit all the information that would enable an inquirer to learn from them the present and the past practice of a special branch of industry, of every country, and thus give him an opportunity to draw some useful conclusions by comparing the differences and finding their causes. If this were not the case at all the former exhibitions, the present included, nothing should be spared to bring about an improvement in the future. The advantages being visible, let us look for the preventive causes. I can see but three of them: economy, indolence and national jealousy. The first, which is the most prominent, is only a falsely understood economy. Small manufacturers cannot afford to make expensive exhibitions, but by aid from the national treasury, however, and by the organization of clubs, they can largely diminish the expenses. But can this be the case with large corporations like the railroad companies (and to them I am principally speaking)? Is it not a cheap bargain to exchange the experience of one road for that of great many of them? or is there anywhere a railroad company which has nothing to learn from the practice of other railroads? Indolence is a not much less effective preventive than the last-named. It is a difficult task to arrange such an exhibition as I am speaking of; it requires knowledge, energy and time; and each of these conditions is equally essential for carrying out the undertaking, and either of them may be a preventive cause. But serious as this objection may be, it can be obviated by a timely commencement of the work, instead of waiting until there is no time to overcome the difficulties. As to national jealousy, Americans although possessing self esteem in a very high degree, are in that respect the most liberal people on earth; the foreigners whom business or curiosity has brought to America speak publicly about it with a sort of admiration and surprise. The case is different, however, with European nations (more with some, less with others); secrecy is considered by them to be of vital importance for prosperity—a mistake which they ought to have discovered, judging from American experience.

The Austrian railroads are the only ones that have made in Paris as thorough and complete an exhibition as the circumstances, not complicated by lack of good will, have permitted. But to gain any advantage from an exhibition it is not enough to take a part in it, and they have thus sent their engineers and other prominent officers, in liberal numbers, to see and examine what others have exhibited. I have seen there more Austrian engineers than all others taken together, French excepted—they being at home. It is not that every different type of locomotive, or car, or rail-joint, or signal, etc., has been sent by them to Paris; there is a tolerably large number of these objects represented, and the rest can be found in models, in excellent catalogues, drawings, graphical representations of the consumption of materials, printed tables, rules, and so forth. It was also easier to get any desired information in this department than in any other.

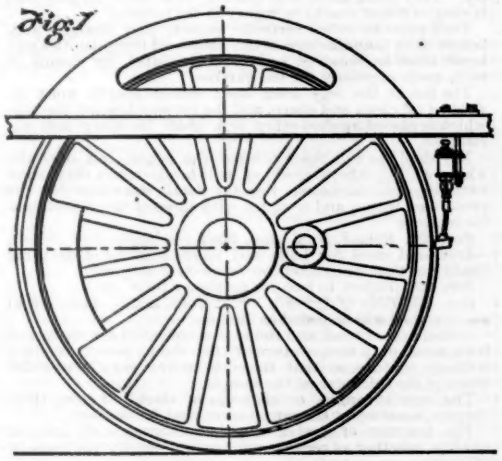
Among the exhibits of the Imperial Royal Private Austrian State Railroad Company* is an apparatus for lubricating the flanges of the forward locomotive drivers. I think it of sufficient importance to warrant more than a mere notice, and I call special attention of American master mechanics to the economy they can effect by making use, in certain cases, of this unpretentious apparatus. The accompanying engraving represents, in fig. 1, the method of attaching the apparatus to an Austrian locomotive, in fig. 2 its elevation, in fig. 3 its section, and fig. 4 its plan, with the supporting bracket cut off. The working of the apparatus will be easily understood from the illustrations. The lubricating matter is dropped from an oil-cup slowly by means of a wick, through a small pipe, on a brush that touches the concave part of the wheel flange. The brush, its holder and the pipe, are held by a spring (seen in fig. 3) in such a position as to keep the brush always in contact with the flange. The brush consists of several pieces of flat wick (as used in petroleum lamps) taken together, and held fast by means of a thumb-screw, as seen in the illustration. The State Railroad Company has been lubricating the wheel flanges of the forward locomotive drivers in this way since 1871, and find it economical to apply it to all locomotives running on curves of small or even of large radius. The experiments made in 1871 and 1872 showed an economy of forty per cent in the life of wheel tires, and an economy in the wear of rails. The consumption of lubricating matter is insignificant. It will not be out of place to give here a short history of the introduction of the lubrication of wheel flanges and the first experience with it, as given to us by Mr. Fischer v. Roesslerstamm, the introducer, and at present the *ober-ingenieur* (Chief Engineer) of the Elisabeth Western Railroad in Salzburg, Austria.

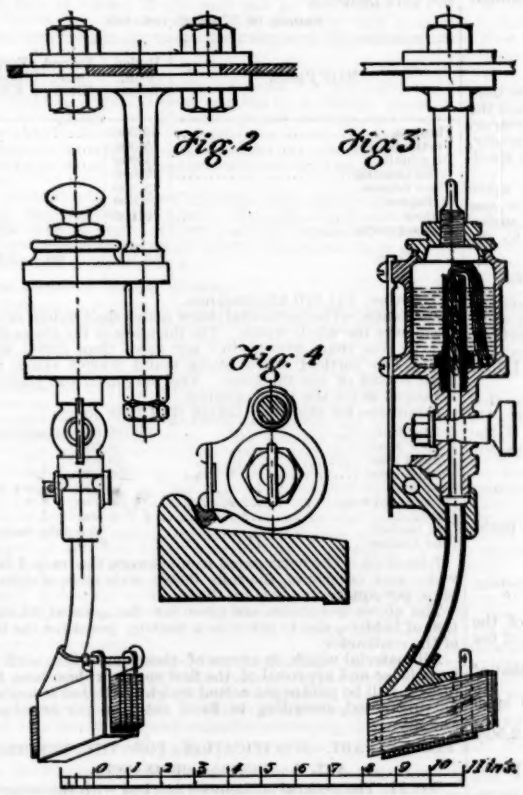
On the Linz-Budweis Railroad, in Austria, the wear of the locomotive wheel flanges when running on curves was so considerable that it led Mr. Fischer von Roesslerstamm to try the experiment of lubricating them with the dirty oil from the axle-boxes. This was not allowed to him for fear that the wheels would slip, and the brakes would not be able to act on them. An accident had resulted from such cause on another road. To protect the flanges from wear, he therefore invented a method of lubricating them with a hard material, using in winter pure mutton tallow, poured in a mold made of the thinnest zinc plate, which was worn together with the tallow on the wheel flanges; and in summer he added some vegetable wax and mineral wax (ozocerite) to the tallow in order to diminish its fusibility (the latter, if used in too large quantity, may spoil the lubricating quality of the tallow). This mode of lubricating the flanges can be found now on many of the Austrian railroads. A similar arrangement is used to lubricate the wheel flanges on the Upper Silesia Railroad.

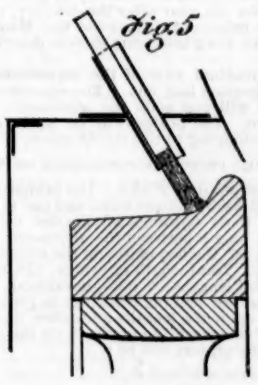
* The name of this road is accounted for by the fact that it was first the property of the government, and afterward sold by it to a private corporation—chiefly composed of French capitalists; and this further accounts for the considerable influence which French ideas have had in Austrian railroad practice.

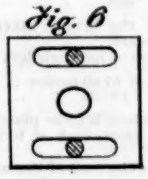
It is represented by figs. 5 and 6, and consists of a gas-pipe, about ¾ in. in diameter and 4 in. long, brazed to a plate 4 in. square, at an angle of 60° (fig. 5), and fastened to the wheel-cover, or a support made specially for it, by means of two bolts and nuts. The bolt-holes in the plate are slotted, to enable it to be adjusted laterally (fig. 6). In the gas-pipe is placed another pipe of zinc, ⅝ in. in diameter and about 8 in. long, the lower part of which is filled for one-fourth of its height with thick cow-hair felt, which at the bottom projects from the pipe about ⅝ in. and touches the concave part of the wheel flange. The upper part of the zinc pipe is filled with pure rape oil in winter, and in summer some petroleum is added to it. The zinc pipe wears out in about three or four months, and has to be replaced; the felt is changed according to the weather in two to four weeks. In wet weather the zinc pipe is taken out. There is no danger that the tread of the wheel or the top of the rail will be lubricated, if the brush touches the proper place; and the centrifugal force prevents the oil from falling from the flange on a surface of smaller diameter.

The lubrication of locomotive wheel flanges not only produces an economy in the wear of tires and rails, but also diminishes considerably the resistance of the train. On the Austrian Western road, between Gmunden to Englehat, a a locomotive can haul eight cars when the flanges are lubricated, and only seven cars if they are not. In the same place the sun-beams are said to produce in summer a very slippery surface on the rails, and the locomotive drivers slip then if the flanges are not oiled. The lubrication of locomotive forward wheel flanges is coming into general use in Austria and the neighboring countries, and in America, where the roads are curved more than anywhere else, it will be worth while to try the experiment. The arrangement like that used on the Hessian road (fig. 5) costs only 95 cents for two wheels, and the oil consumed amounts to 0.045 ounce per mile. Nothing connected with this lubrication has ever been protected by patents.





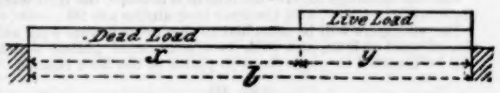




Short Rule for Finding the Counterbrace Limit in Girders.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Shreve has shown that the point sought is coincident with the point of "no vertical strain," or, in other words, that "shear" at that point is the same both from the loaded and the unloaded segments of the girder; also, that it lies under the forward end of the advancing live load.



Call the segments above referred to x and y, respectively; the length of the girder in feet, l; the dead load per foot run, w, and the dead and live load together per foot run, W. Then the shear from $x = \frac{w x^2}{2 l}$; that from $y = \frac{W y^2}{2 l}$, and at the point these are equal, or,

$$\frac{w x^2}{2 l} = \frac{W y^2}{2 l}$$

Eliminating common factors $w x^2 = W y^2 \therefore x^2 = \frac{W}{w} y^2$ and $x = y \sqrt{\frac{W}{w}}$. Also $x = l - y \therefore l - y = y \sqrt{\frac{W}{w}}$; $l = y \sqrt{\frac{W}{w}} + y$, and finally

$$y = \frac{l}{\left(\sqrt{\frac{W}{w}} + 1\right)}$$

Which may be written thus as a

RULE: *To find the distance from either bearing to the*

counterbrace limit in a girder, divide the sum of the dead and live loads per foot run by the dead load per foot run and extract the square root of the quotient, to which square root add 1, and with this sum divide the length of the girder between supports; the last found quotient will be the distance sought.

WM. F. SHUNK.

Rushton's Ejecter on Coal-Burning Engines.

ATLANTA, Ga., Sept. 5, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I observe in your *Gazette* of Aug. 23, 1878, a notice of my "patent spark ejector." * * * You do me great injustice by stating that "it has been used on wood-burning only," also that "you fear it would not be efficient where coal is burned, as the cinders are then liable to cake into a more or less solid mass." Let me inform you that this is *not true*, as I have now some 18 pipes running in Georgia and Alabama, *all* burning coal, and *all* giving perfect satisfaction.

This "ejector" was gotten up *for coal especially*, but it will answer equally well with wood or coal.

Please correct the mistake and greatly oblige

WM. RUSHTON.

Bridge Specifications as Made in Holland.

[*Translated for the Railroad Gazette.*]

The following translation of the specifications for the manufacture and erection of the metal superstructure for the bridge over the Maas at Crevecœur, July 2, 1868, is given as an example of the requirements made in Holland for similar structures generally:

PART I.—DESCRIPTION.

ART. I.—GENERAL DESCRIPTION.

Sec. 1. The work consists of the manufacture, erection, testing, painting and the delivery in good condition, and the guarantee for one year after the delivery, of the superstructure of the railroad bridge over the Maas at Crevecœur, and of other work belonging thereto described in this specification.

The longitudinal axis of the superstructure must agree with the direction laid out. The superstructure is for one track, and will rest upon the abutments and piles under construction. The bridge will be made according to the drawings belonging to this specification.

ART. II. PRINCIPAL DIMENSIONS OF THE BRIDGE.

Sec. 2. *Length and Width.*—The bridge has 11 openings, of which 10 are 57 meters wide, and one is 100 meters wide.

Each of these openings is spanned by a single bridge. The whole length between the abutments is 714.99 meters. The length of the bed-plates on the abutments is $2 \times 1.75 = 3.50$ meters. Total length of bridge, 718.49 meters.

These exact lengths are not guaranteed. The contractor is bound, before making drawings as prescribed in Sec. 13, to measure anew the lengths and other dimensions. If the result of this measuring agrees with the above figures, the lengths of the girders will be:

For the openings of 57 meters	60.50 meters.
" " " "100 "	106.00 "

The width of the bridge, taken between vertical posts, must be 4.50 meters.

The centre lines of main girders are apart:

For the openings of 57.00 meters	4.80 meters.
" " " "100.00 "	8.10 "

The superstructure is to be placed on the right side of the abutments and piers, that is, to the west of the axis of the railroad.

The distance of the axis of the superstructure from that of the railroad amounts to 3.425 meters.

Sec. 3. No part of the superstructure of the 100m span must reach lower than 11 meters above water mark.

The tops of rails for this span are at a height of 12.50m above water mark.

The main girders of the 57m spans have straight parallel chords with a height of 7 meters.

The bridge of 100m opening has a curved top chord, 12.5m high in the centre and 7m high at the ends. These heights of the girders are measured between the vertical legs of the angles of the flanges.

Sec. 4. The distance between panel points, corresponding with the distance between the vertical posts and cross-bearers, is:

4.46m (14 ft. 7⅛ in.) for the 100m opening.

3.475m (11 ft. 5 in.) for the 57m openings.

The floor beams for the 57m openings must consist of vertical iron plates 75 meters by 10 millimeters (0.4 in.) and four angle irons 100 by 10mm.

The floor beams for the 100m opening consist of a vertical steel plate, 0.71m by 8½mm, and four angles of steel, 80m by 8mm.*

They will be fastened to the vertical chord plates and truss-posts.

The stringers placed 1.50m (nearly five feet) apart, for the opening of 100m, have a length of 4.452m, and must consist of a steel web-plate $520 \times 8\frac{1}{2}$mm and of four angles of steel 90×9mm.

For the openings of 57m the length is 3.465m, the iron web-plate is 520×10mm, and the four iron angles are 90×9mm.†

The stringers will be attached to the cross-beams with angles of steel or iron, and with two horizontal plates which will be inserted through the web-plates of the floor beams.

ART. III.

Sec. 5. (Relates to additional ladders, &c., to be furnished.)

Sec. 6. Over the whole bridge the rails will be laid by the contractor.

Sec. 7. For each span an expansion arrangement for the rails must be prepared and furnished. This apparatus may be double-acting so as to serve for two openings.

Secs. 8 and 9 refer to derricks for removal and replacement of ship-masts, and to help to be given to the shipmasters.

* Under the standard strain of 8,500 lbs. per square inch (600 kilos. per square centimeter) the iron floor beams would bear locomotives which on eight drivers, with a wheel-base of 15 feet, would concentrate 90,400 pounds. Under the same locomotive, including as before the dead load, the steel floor beams would be strained to 17,000 lbs. per square inch (or about 1,203 kilos. per 1 centimeter square). It must be remarked that it is rumored that such steel girders have not proved to be satisfactory throughout; it is said that steel plates cracked at the rivet-holes.

† Under a strain of 8,500 pounds per square inch these girders could bear a uniformly distributed live load of 11,400 lbs. per lineal foot of 11.4 feet panel, or considerably more than is usual in this country.

ART. IV.—QUANTITIES.

Sec. 10. Quantities of different kind of material.

100-METER OPENING.

MAIN PARTS.		Rolled iron. Kilos.	Rolled steel. Kilos.	Forged iron. Kilos.	Forged steel. Kilos.
Girders	Flanges	271,700	.....	.....	.....
	Verticals	83,600	.....	.....	.....
	Diagonals	61,300	.....	.....	.....
Wind-bracing	Upper bracing.	8,200	.....	.....	.....
	Lower bracing.	3,700	5,800	.....	.....
Floor beams		1,700	11,000	.....	.....
Stringers		1,300	17,700	.....	.....
Splice-plates		19,000	.....	.....	.....
End supports		.....	.....	4,000	17,500
Total		450,500	34,500	4,000	17,500

REMARKS.—The horizontal chord plates in their breadth must not have more than two seams.

The vertical chord plates are 600mm apart, and may consist of two or three equally thick plates. The chord plates shall not be less in thickness than 8½mm (⅜ in.) The diagonals consist of flat bars, and are placed flush with the vertical chord plates, to which they are attached with *double* splices, except a few in the centre, as specified.

The posts, the shape of which is shown on fig. 4, will be placed closely within the vertical chord plates. The iron for the lower wind-bracing is for connections with the chords.

The iron for the floor beams is for the vertical angle iron for connection with the webs and chords of the main girders. The iron under the head of stringers is for stiffeners and short stringers at the ends of the span.

The material for the superstructure of the floor proper is not here included.

BRIDGE OF 57-METER OPENING.

MAIN PARTS.	Rolled iron. Kilos.	Forged iron. Kilos.	Forged steel. Kilos.
Flanges	69,300	.....	.....
Verticals	25,000	.....	.....
Diagonals	21,000	.....	.....
Wind-bracing	7,600	.....	.....
Floor beams	13,300	.....	.....
Stringers	12,800	.....	.....
Splices	9,100	.....	.....
End supports	.....	60	3,210
Total	158,100	60	3,210

Together, 161,370 kilogrammes.

REMARKS.—The horizontal chord plates shall consist of one plate over the whole width. The thickness of the plates shall not be less than 8mm (⅜ in.) nor more than 15mm (0.59 in.) The vertical chord plates stand 300mm apart, and must consist of one thickness. The diagonals and posts are arranged as for the 100m opening.

Quantities for the whole bridge (718.49 m long):

Rolled iron	20,780,000	kilometers.
Rolled steel	34,600	"
Forged iron	28,800	"
Forged steel	50,500	"
Cast iron	16,500	"
Corrugated iron	54,700	"
Lead	500	"
Oak lumber	65.5	cubic meters‡
Pine lumber	82.0	"

REMARKS.—The corrugated iron between the rails 1.30m wide, and outside of the rails 0.30m wide each, weighs 40 kilos. per square meter (½ in. thick).

The above quantities are given for the general information of bidders, and to serve as a starting point for the bills of the contractor.

All material which, in excess of these quantities, with the knowledge and approval of the first engineer, has been furnished, will be paid as per actual weight. All that is less will be subtracted, according to fixed rates, as per articles 22 and 23.

SECOND PART.—SPECIFICATION FOR THE ERECTION.

ART. V.—GENERAL ORDINANCES.

Sec. 11. The general ordinances, marked with the letters A V, and fixed upon by the Secretary of the Interior, March 1, 1866, have power and are literally obligatory on the contractor as if they were incorporated into this document. Any deviation therefrom will be specified in the sequel.

ART. VI.—DRAWINGS.

Sec. 12. Before commencement of work the contractor must make drawings of all details of the bridge, of the erecting scaffolds, of the parts serving for future painting and repairs and of the expansion apparatus to be furnished at Utrecht, in consultation with and in accordance to the orders of the First Engineer.

These drawings to be made on the scale of 1 to 20 for the views, plans and sections of the trusses; in the scale of 1 to 10 for the connections, splices, rollers, etc., and of full size, or at least one-half scale, for special parts, as connections, angle-irons, rivets and bolts, expansion apparatus, etc.

The drawings must clearly show in what manner the different parts are to be put together and connected. All dimensions must be clearly written in millimeters.

These drawings must be accompanied with a new and correct calculation of the weights in kilogrammes of all parts of the superstructure. In making this calculation, the specific gravity of rolled or forged iron is assumed at 7.8 (3.325 pounds for 12 cubic inches), and that of rolled or forged cast steel at 7.9 (3.367 pounds for 12 cubic inches).

These drawings and calculations to be subjected to the examination of the Secretary of the Interior. When the drawings have been finished so as to meet with approval, two sets of neat copies on drawing paper must be made, and must be signed as the final ones by the engineer and the contractor.

One of these sets remains in the hands of the contractor, who will carry out the work in accordance therewith. The other set remains in the hands of the First Engineer. Moreover, of these drawings and tables of weights 50 sets of lithographs must be furnished, the proofs of which will be examined by the First Engineer.

Sec 13. *Deviations from the Drawings.*—According to the approved drawings the work must be carried out.

No deviation can take place except with distinct approval of the First Engineer and of the contractor, and the approval must be acknowledged by their signatures, the deviations being shown on the drawings in red ink.

Sec. 14. After completion of the whole work the contractor must furnish within four months three sets of drawings of the work as actually carried out, all according to specification and model, and of all parts, as uprights, sections, details, views, etc., which may be desired.

‡ 1 cubic meter contains 424 feet, board measure.

1 kilo. per square meter is equivalent to 0.204 pounds per square foot.

ART. VII.—CONNECTIONS.

Sec. 15. *Splices*—In making the working drawings as above, the following principles must be considered: The splice-plates, with holes, and the rivets or bolts must replace without loss the strength of parts to be connected.

Wherever possible, *double splicing* must be used. The splice-plates must be sufficiently long to receive the necessary number of holes, and the rivet or bolt-holes must not come together too closely.

Sec. 16. *Bolts or Rivets.*—The holes must be apart between their centres not less than 2½ times their diameters. Moreover, they must be placed in such a manner as not to cause the zigzag shearing of the plate. No centre of a hole shall be nearer to the edge than 1½ times the diameter.

ARTICLE VIII.—QUALITY OF MATERIAL.

Sec. 17. *Rolled Iron.*—The rolled iron, as plates, angle, channel and other iron, which has passed through rolls, must be well welded, tough, not brittle; it must allow forging in a cold and in a warm state. It must be hackly§ in fracture, and of fine and uniform fibre, and likewise as regards its exterior appearance, it must exhibit all signs of wrought iron of the greatest strength.

Sec. 18. *Steel.*—The steel must be cast steel and not puddled, of a quality not inferior to the samples kept in the office of the First Engineer of Utrecht. It must admit of forging, and must be entirely uniform in fracture. The steel for the floor beams and stringers, wind-braces, etc., is specified as regards its strength.

Sec. 19. *Iron and Steel Plates.*—Iron and steel plates, in their quality, must at least be equal to those used in the manufacture of steam boilers.

Iron or steel plates, hard or soft in fibre, or which under the process of manufacture, be it bending or boring or chipping and facing, show splits or sheared spots, will be condemned.

They must be perfect in their surfaces and well rolled, without laminations, blisters or open places.

Their perfection will be subjected to a close examination in every regard.

The plates shall have the greatest possible length, but shall not be thicker than 15mm (0.59 in.)

The width of these parts are given in the drawings.

Plates heavier than 350 pounds shall be tested.

Sec. 20. *Angles and Channels of Steel.*—Angles and channels of steel, or any other sections, must be of the best quality. They must allow cold bending and easy forging and boring, without cracks or injury at the corners.

They must be rolled perfectly regular and straight, and, before their manufacture in the shops, all irregularities and bends must be removed on cast-iron plates, by means of tools made expressly for the purpose.

The fins at the legs over their whole length must be worked off clean and sharp, and the corners toward the side which is placed against other iron shall be sharp and not rounded.

Nor shall the legs taper toward the edges, but over the whole width; where rivet or bolt-heads come they shall have an equal thickness. See the detail drawings for the prescribed forms, and compare with those of the objectionable sections

Sec. 21. *Round Iron and Steel for Bolts and Rivets.*—Iron and steel for bolts and rivets must be of the same quality as that prescribed for *locomotive boilers.*‖

Sec. 22. (Refers to iron for accessory tools, etc.)

Sec. 23. *Tests of Quality.*—Flat irons, angle, channel iron and the steel will be tested as follows:

Rolled iron or steel, and round iron and steel for rivets and bolts must, at a temperature of 104° Fahr., permit bending without rupture, so that the ends become parallel at a distance of the thickness of the sample.

The legs of angles or channels of steel, cut along their corners, must resist the same test as that for the flats.

The fracture of steel of any section must be of uniform quality, whether as regards color or uniformity and density of grain.

From several steel pieces ends will be cut off which, in the presence of the First Engineer or his representative, will be hardened by plunging into pure water without any mixture of any other substances.¶

The fracture of these pieces must be uniform in quality and without any spots.

Plates will be bent over a cylindrical surface with a diameter of 1½ times their thickness; they will be straightened again, and this treatment they must endure without alteration anywhere.

Sec. 24. *Tests as to Resistance under Tension.*—Rolled iron or steel will be subjected to the following tests, which they must be able to resist, and to which the First Engineer will give his special orders and directions:

The rolled iron and the steel, in the direction in which they were rolled, must resist for 15 minutes, without shearing or rupture, loads which for the iron amount to 36 kilogrammes per square millimeter, and for steel to 60 kilos. (51,000 and 85,000 pounds, respectively, per square inch).

Vertical chord plates, and other parts which are strained in a direction perpendicular to the fibres, must resist in that direction strains 85 per cent. of those named.

The tests will be made by means of an approved hydraulic or other testing machine.

While making these tests the extensions will be observed carefully, the strains being increased successively by additions of 5 kilogrammes per square millimeter (7,000 pounds per square inch).

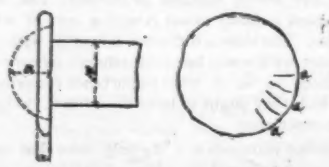
With some pieces, as ordered by the First Engineer in charge, loading will be continued until those test pieces break.

Of those parts whose sections are too great to be broken, either by tension or pressure, a piece or strip shall be cut off in the presence of the First Engineer in charge. These pieces shall be worked off carefully to equal sections; they shall be filed off cold, and then shall be subjected to the same tests.

Rolled iron for rivets and bolts, moreover, will be tested as follows: Some plates will be connected by one rivet or one bolt. These rivets or bolts will be subjected to pure shearing forces as well as to tension in the direction of their

§ That is, showing a feathering of little hooks, like those of hemp or hachel, along the fibres.—TRANSLATOR.

‖ In some shops this test is in use. The rivet heads are hammered flat in a solid state until the heading is only one-third as high as it was. No cracks, *a*, *a*, *a*, should appear.



¶ By this specification the Dutch engineers will succeed in getting real steel, and will avoid being supplied with iron made by the Bessemer or Siemens-Martin process.

shanks. Iron bolts or rivets must withstand, without rupture, tensions of 40 kilos. per square millimeter (56,800 lbs. per square inch), and must resist shearing strains of 33 kilos. (46,860 lbs. per square inch). For steel rivets or bolts, the respective figures are 60 and 50 kilos. (85,000 and 71,000 pounds).

In making these tests the heads or nuts shall not break, not even if the loads be increased.

In making these tests the First Engineer in charge shall take no more than 3 per cent. of the same section of plates, bars, angles or channels, and iron or steel of any other section, and he shall select at least one piece of every kind, to be subjected to each of the tests prescribed.**

If then the first piece withstands the test prescribed, he may omit the test of a second sample.

If two pieces, subjected to a test, do not withstand the proof, the whole set furnished to which these pieces belong shall be condemned.

Moreover the First Engineer in charge, by straight tension or pressure or by flexure under dead load or by a falling weight, may make such tests as by him may be considered to be proper in order to determine the quality of the material furnished.

Sec. 25. *Tests of Elasticity.*—To test the elasticity the First Engineer also may take 3 per cent. of the pieces of the same sort of iron or steel and subject them to the following tests:

Of the riveted pieces ready to be shipped from the shop to the bridge site, as for instance floor beams, stringers or vertical posts, before their being shipped one piece of a kind must be subjected to the following test:

The piece will be placed on two fixed points, and will be loaded so that a calculated strain is produced for wrought iron of 14 kilos. per square millimeter (20,000 lbs. per square inch), and for steel of 26 kilos. (37,000 lbs. per square inch). During a time of at least 20 minutes the pieces must be subjected to these tests, and on removal of the load no permanent flexure must be visible. The flexure, even in case of a concentrated load in the middle, must, moreover, take place in a regularly curved line without sharp curves or distortions.

The whole set, one part of which does not stand this test, will be condemned.††

Sec. 26. The corrugated iron must be furnished as per sample, in plates at least 3m. long and 650 or 300mm. wide. The lengths must be taken so that the joints fall in the middle line of a wooden tie, and the iron will be screwed to them with countersunk wood-screws.

Sec. 27. Wood must be sawed on all sides. The pine wood shall be of the best quality, straight in fibre, without great knots, splits or other faults, and shall be thoroughly impregnated with sulphate of copper, after which it shall be bored and the proper bearings for the rails shall be cut.

(TO BE CONTINUED.)

** For a great bridge over the Volga River the inspecting engineers test at least two pieces of a kind, keep records as per direction of their employers, label each sample with date and result, send one sample to Russia, and at the same time send a sample of the same class of iron home to be tested there. In this manner both the contractor and the inspecting engineers are watched.

†† This is a severe test on workmanship, more especially if a concentrated load be applied.

RAILROAD LAW.

Liability for Running Over a Drunken Man.

In Hankerson against the Southwestern Railroad of Georgia, suit was brought in the Circuit Court to recover damages for injuries received by being run over by a train on defendant's road. Counsel for the defendant requested the Court, in writing, to give the jury the following charge: "If the plaintiff, Hankerson, in a state of intoxication, and in consequence of such intoxication, wandered off from the public road and its crossing over the railroad track and sat down, lay down or fell down on the railroad track, between the stringers, in consequence of such drunkenness, and lay there in a state of drunken insensibility, and the train of the railroad ran over and injured him in that condition, then the plaintiff cannot recover anything for such injuries, and your verdict in such case should be for the defendant." The Court gave the charge as requested, with the following qualification: "Provided, that the railroad company has made it appear that their agents exercised all ordinary and reasonable care and diligence to prevent such injury."

Under this charge the jury gave a verdict of $350 for the plaintiff. On appeal the Georgia Supreme Court reversed the judgment, holding as follows: "This qualification of the defendant's said request is the main ground of error complained of. Whether the charge requested was a proper legal charge to have been given in view of the evidence in the record we express no opinion, but assuming that it was a proper legal charge, as the Court did by giving it as requested, it was error to qualify it in the manner as set forth in the record. This was a suit for an alleged physical injury done to the plaintiff by the defendant. If the plaintiff was voluntarily drunk, and in that condition placed himself on the defendant's railroad track, he was not entitled to recover at all under the provisions of 2,973d section of the code, whether the defendant was negligent or not. But if he was not drunk and could not have controlled his powers of locomotion from sudden attack of disease, or other involuntary cause, and in consequence thereof was involuntarily upon the defendant's railroad track, then the question of negligence of the defendant might have arisen under the provisions of the 3,034th section of the code."

THE SCRAP HEAP.

Railroad Manufactures.

The Danforth Locomotive Works, at Paterson, N. J., have sold two locomotives to the Port Royal & Augusta road.

The Rogers Locomotive Works, at Paterson, N. J., have received orders for six locomotives to go abroad, and have recently sold four engines which were in stock.

The Brooks Locomotive Works, at Dunkirk, N. Y., recently delivered two new engines to the Rochester & State Line road.

Mr. Benjamin G. Clark has been appointed Receiver of the Oxford Iron Co. by the Chancellor of New Jersey. The company owns two blast-furnaces, rolling mill, nail, spike and bolt mills, and a tract of iron land at Oxford, N. J., and some coal land near Scranton, Pa. It has done a very large business. The liabilities are stated to be $2,182,000, of which $751,000 is in the form of mortgage bonds; assets nominally about $1,720,500. It is thought all the liabilities can be met, with careful management.

The Hinkley Locomotive Works, in Boston, are building some freight engines for the St. Louis & San Francisco road.

The car works of John L. Gill, at Columbus, O., are building 100 coal and 25 box cars for the Columbus & Toledo road.

The Kimberly Rolling Mill, at Sharon, Pa., is running full double turn.

The rail mill of the Edgar Thomson Steel Works, at Braddocks, Pa., is running full double turn.

The Pittsburgh Forge & Iron Co. is running all its departments single turn.

The Vulcan Iron Works, at Chattanooga, Tenn., are building six new puddling furnaces.

The Ohio Falls Car Co., at Jeffersonville, Ind., is building 15 passenger cars for the Atchison, Topeka & Santa Fe.

The mill of Reese, Graff & Woods, at Pittsburgh, was sold Sept. 6, at public sale, for $40,000 to John Graff, of Graff, Bennett & Co., who held a mortgage for $76,000 on the property.

Bridge Notes.

Rainnie & Henderson, of St. John, N. B., recently completed a bridge over Merritt's Brook on the St. Martin's & Upham road. It is one of the highest bridges in New Brunswick, being 85 feet from the stream to the top of the rail.

Mr. A. Kloman has leased the old Superior Rail Mill at Pittsburgh, and will run it on bridge work, both iron and steel.

The Delaware Bridge Co., Charles Macdonald, President, is building three iron viaducts for the Atchison, Topeka & Santa Fe; a double track iron bridge at Downingtown, Pa., for the Pennsylvania Railroad, and several spans of iron bridge for the Quebec, Montreal, Ottawa & Occidental.

Wilkins, Post & Co., engineers and bridge-builders of Atlanta, Ga., have contracted to build a pier for a draw-bridge for the Mobile & Montgomery road. The pier is to be built by using a jacket 20 ft. in diameter, made of plate and angle iron, and a cast-iron centre-piece, the space between the two to be filled with concrete.

Notes.

Anyone who wants to study the history of locomotive building should visit the Erie yards and shops. No railroad in this country owns a greater variety of equipment, old and new.

New Yorkers find it just now a little cheaper to travel than to stay at home. When they can go to Boston, 240 miles, for a dollar, and to Albany, 150 miles, for half that, they certainly ought to make no complaint of passenger rates.

The commuter on suburban railroads is a sore trial to the express companies. He stoutly contends for the right to carry anything, from a crate of peaches to a 200-lb. packing-box, as baggage. He generally gets it through, too, for most companies do not care to fight their commuters for the sake of the express people, and trainmen are generally lenient, not forgetting Christmas presents and other small favors received.

And now the baggage-man groweth thin and worn, and lines of care appear in his face. The city depot also resoundeth with the crash, and reëchoeth the occasional "cuss-word" as the mighty Saratoga trunk is passed out on its way home from the summer resort.

A New Kind of Stock Traffic.

The Pittsburgh *Telegraph* tells the following extraordinary story: "Who ever heard of cats being an article of commerce in this country? One would not be surprised to know that there were such, were Chinamen about, for the average celestial is generally supposed to have a weakness for cat-flesh. The first instance we know of where cats have been transported from one part of the country to the other in any number was recently, where three car-loads passed over the Canada Southern Railway, bound west. The animals were transported in cattle-cars, which had been fitted up with four decks each for the purpose. There they were, of all sizes and colors, and such a chorus they made when they lifted up their voices together. The explanation of this new departure in the live-stock trade is that some of the Western states are becoming completely overrun with rats, and cats, their natural enemies, being scarce, some enterprising individual had undertaken to draw a supply from the East, where they are more plentiful. Let us hope there is a better fate than drowning in store in the time to come for the overplus of pussies, and that our friend, who may be regarded as a pioneer in this trade, has made a handsome thing out of his venture."

Unfortunately the Saratoga Conference failed to fix the rates on cats, or to make any arrangements for the division of the traffic. Unfortunately also, the industry of cat-raising has long been pushed to such an extent in the West as to lead to great over-production and unlimited drowning of kittens.

A Washoe Train Wrecker.

Pom, the Washoe brave, who was arrested some time ago for placing obstructions on the track of the Central Pacific Railroad and who pleaded guilty in the County Court on Monday morning, is evidently one of the few people that believe a confession is good for the soul. He explained to detective Harris the circumstances connected with his efforts as an "obstructor." It seems that Pom and several more Indians got drunk first and then got on a train that chanced to come along. In a spirit of deviltry they pulled the bell rope that passes through the cars, and stopped the train two or three times. The conductor put them off. As soon as the cars started up again Pom tried to climb on one of them. The conductor then hit him a smart blow over the head, and he keeled down an embankment, and the train passed on. Although Pom's head was hurt somewhat, his feelings were damaged to a much greater extent. The demon spirit within the red man's breast was aroused. Half-sobered by his sudden ejectment, his only thought now was how to avenge the wrong that the pale-face had inflicted him with. Ascending a high embankment over the track Indian Pom hurled some very large rocks down on the rails. Then he built a camp-fire, and, wrapping his blankets around him, lay down to await the catastrophe that he hoped to bring about, and went to sleep. A passenger train came dashing along the track. The pile of rocks was rapidly being neared. Tearing around the curve at full speed came the iron horse, drawing a precious cargo of human beings. Suddenly the engineer saw just ahead only a few feet away the trap that had been set for the palefaces. The engine was reversed, brakes put on. Had another second elapsed before the precautions were taken 40 or 50 souls would doubtless have been hurried into the unknown future. As it was, with the exception of smashing up some of the railroad's costly material, no damage was done. Pom ought not to have any credit for the happy result, for he did everything in his power to bring about an "accident as was an accident." Ever since he made the confession, the irrepressible scamp has insinuated that he was mad enough at himself to take his own scalp when he woke up and found out that the fun was all over and he hadn't seen any of it. Pom will be sentenced this morning. His plea is that he was drunk, "alle same white man."—*Nevada City (Cal.) Transcript, Aug. 28.*

Prizes at the Paris Exhibition.

Among those receiving gold medals, the following American exhibitors are unofficially reported: American Watch Co., of Waltham, Mass.; Barnum Richardson Co., car wheels, and cold-blast charcoal iron; Collins & Co., Hartford, axes and edge tools; J. A. Fay & Co., Cincinnati, wood-working machinery; Hines & Ginna, New York, oil tank; E. & T. Fairbanks, scales; Hoopes & Townsend, Philadelphia, nuts and rivets; Lobdell Car-Wheel Co., Wilmington, Del., chilled cast-iron car-wheels and rolls; Striedinger & Doerflinger, Brooklyn, N. Y., model of blasting apparatus; Hancock Inspirator Co., Boston, inspirator; Browne & Sharpe Manufacturing Co., Providence, machine tools; John Stephenson & Co., New York, street cars; Westinghouse Air Brake Co., atmospheric brake; Pratt & Whitney, Hartford, Conn., machine tools; Providence Tool Co., firearms; A. Whitney & Sons, Philadelphia, car wheels. A diploma of honor is awarded to the American Society of Civil Engineers for its exhibition of drawings, plans and models, and a silver medal to H. F. Krause, of New York, for his topographical maps, in which the hightest points are lighest, and the shade increases with the depression. Also, silver medals are awarded to Adams & Westlake, Chicago, lamps and lanterns; L. W. Leeds & Co., New York, engineers of heating and ventilation plans; Allen & Roeder, New York, pneumatic boiler-riveting machines; Anton Hein and J. B. Hoyt & Co., New York, leather belting; Stow Flexible Shaft Co., Philadelphia, flexible shafting; C. H. Delamater & Co., New York, shearing and punching machines; Morse Twist Drill and Machine Co., New Bedford, twist drills; Douglas Axe Co., Boston, axes and edge tools; Welsh & Leas, Philadelphia, car wheels; Valentine & Co., New York, varnishes; J. G. Brill & Co., Philadelphia, street cars; Philadelphia & Reading Railroad Co., anthracite coal and locomotive for burning anthracite dust; Pullman Palace Car Co., model of sleeping car; Howe Scale Co., Brandon, Vt., scales; United States Wind Engine & Pump Co., Batavia, Ill., wind mills.

Bronze medals are reported awarded to Oliver Ames & Sons, North Easton, Mass., shovels; W. & B. Douglas, Middletown, Conn., pumps; Hercules Lever Jack Co., Newark, N. J., lever jack; Stanley Rule & Level Co., rules and levels; Pennsylvania File Works, Philadelphia, files; Wm. Tilden & Stokes, New York, varnishes; A. Whitney & Sons, Philadelphia, car wheels.

Honorable mention is reported for the following: M. B. Edson, New York, recording and alarm gauge; E. Harrington & Son, Philadelphia, hoisting machine; Nathan & Dreyfus, New York, lubricators; R. H. Allen & Co., New York, warehouse trucks; National Car Spring Co., New York, car springs.

The official announcement of the awards will not be made for six weeks yet, and the reports now received are supposed to be based on private information given to the exhibitors by the jurors. That they are not always correct appears from the fact that several competitors advertise "the only gold medal," and that in many cases both a high and a low award are reported for the same exhibit.

Prizes Awarded by the Institution of Civil Engineers.

The Council of this incorporated society have awarded the following premiums for some of the original communications presented during the last session, on account of the science, talent or industry displayed in the consideration of the several subjects dealt with: For papers read at the ordinary meetings—1. Telford medals and Telford premiums to Richard William Henry Paget Hicks, LL.D., Assoc. Inst. C. E., and John Richard Brittle, Assoc. Inst. C. E., for their paper on "Some Recent Improvements in Dynamo-Electric Apparatus." 2. A Watt medal and a Telford premium to Henry Davey, M. Inst. C. E., for his paper on "Direct Acting or Non-rotative Pumping Engines and Pumps." 3. A Telford medal and a Telford premium to Thomas Curtis Clarke, M. Inst. C. E., for his paper on "The Design Generally of Iron Bridges of very large Span for Railway Traffic." 4. A Watt medal and a Telford premium to Bradford Leslie, M. Inst. C. E., for his paper on "The Hooghly Floating Bridge." 5. A Telford premium to James Atkinson Longridge, M. Inst. C. E., for his paper on "The Evaporative Power of Locomotive Boilers." 6. A Watt medal and a Telford premium to Alfred Holt, M. Inst. C. E., for his "Review of the Progress of Steam Shipping during the last Quarter of a Century." 7. The Manby premium to Edward Bazalgette, Assoc. Inst. C. E., for his paper on "The Victoria, Albert and Chelsea Embankments of the River Thames." The Howard quinquennial prize for 1877 to Henry Bessemer, M. Inst. C. E., as—in terms of the bequest—the inventor of a new and valuable process relating to the uses and properties of iron.

Railway Extension in France.

MM. Beral and de Basire, engineers, who were commissioned last January by M. de Freycinet, Minister of Public Works, to investigate at home and abroad the construction and working of railways of local interest, recommend in certain cases the reduction of the gauge from 1.44 meters to one meter, or even three-quarters of a meter, that as a rule land should be bought only for a single line, and that the gradients should not exceed .025 per meter [130 ft. per mile]. The weight of the rails should be from 22 to 25 kilogrammes per meter [44 to 50 lbs.] if of iron, or from 18 to 20 kilogrammes [36 to 40 lbs.] if of steel. The sleepers should be 2.35 meters long by .22 or .25 broad, and .16 or .15 thick. The greatest possible economy is suggested in the construction and details of maintenance of way of the line. The engines should have three connected axles, and carry their own water and fuel. The rolling-stock should be at a minimum, any casual pressure being met by borrowing from the neighboring main line. Under these conditions the cost per kilometer would be from 60,000 fr. to 90,000 fr., the average being 73,000 fr. [$23,000 per mile.] The daily trains in each direction should be two, or at most three—on some lines only one—subject to a casual increase. All should carry both passengers and goods, and the average speed, including stoppages, should be about twenty kilometers [12½ miles], it being reduced at sharp curves and level crossings. The rates should mostly be higher than on existing lines, and the accounts reduced to what is strictly necessary, and the terms for joint use of stations regulated by the traffic and the advantage to the main line of a feeder. The above arrangements and calculations relate to railways properly so called on which the usual gauge of 1.44 meter is retained. As to a narrower gauge, whether on ordinary roads or not, the same arrangements would apply, except that the speed on lines alongside highways should not exceed fifteen kilometers [9 miles] per hour. It should be added that the width and solidity of the line would be diminished, and the bridges and viaducts constructed generally of wood.

Train Signals.

Mr. G. Pike, a conductor on the Grand Trunk road, has rigged up a bell in his caboose, and connected it with the signal cord, so that the engineer can communicate with him. It also serves to signal the conductor as well as the engineer, if the train happens to break in two.

Mr. Pike has also devised an arrangement which gives warning to those in a station when a switch is opened. The signal bell in the station begins to ring as soon as the switch is open, and continues to ring until it is shut again.

Prices of Rails.

Sales are reported of 500 tons of steel rails at $45 per ton delivered at tide-water. Steel rails are quoted at $43 to $45 per ton at mill and iron rails $32 to $36. In old rails, 1,500 tons are reported sold on private terms. Nominal quotations are $16.50 to $17.50 per ton.

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

SPECIFICATIONS.

A disquisition on this subject might very properly begin, like a boy's composition, by saying that there are different kinds of specifications—good, bad and indifferent—the two latter classes including by far the greatest number. It often happens that by referring to the definition of a term the subject designated assumes a distinctness and clearness which the term itself does not at first convey. Thus Webster gives the definition of "specification" as "a written statement containing a minute description or enumeration of particulars as the terms of a contract, etc." That the descriptions contained in many contracts for railroad work are often very far from being "minute," any one with experience in such matters must know, and it also happens very often that not only are the "particulars" not enumerated, but that general and essential conditions are not stated. Thus, in locomotive specifications, it is not uncommon to find that neither the number, kind nor location of the wheels is described, and in some cases dimensions are given and a limit of weight assigned which are quite incompatible one with the other. Sometimes it is stipulated that engines of a certain size and weight shall take loads which could only be drawn by modifying the law of gravitation or the principles which govern the friction or adhesion of the wheels on the rails. Specifications are, however, defective oftenest by the omission of essential details or particulars, which the one party, after the work is done, will insist were implied, while the other is equally strenuous in asserting they were not, or, if they were, that they would or should have been "nominated in the bond." Thus, in the letting of a contract for a bridge in a neighboring city some years ago, the successful bidder was able to give a low price by omitting to specify that the bridge should be painted after erection. The omission was not observed until after the contract was awarded. In fact, the drawing up of specifications for engineering work requires a very high order of ability, and instead of being delegated to inexperienced assistants or young draughtsmen, as it often is, it should be the work of engineers of the most mature experience, and who are able to do themselves credit not only when they keep silent, but who are gifted with a sufficient amount of training in the use of language to describe clearly and comprehensively the general principles and the minute particulars which must or should be fulfilled in doing the work. This can only be done by a person who thoroughly understands the subject, not from a theoretical point only, but in all the practical details which are so essential to the successful accomplishment of any engineering project. The men who pride themselves on being practical often, for the reason that they are ignorant of many things which others know, or because they cannot express their knowledge in written language, are almost certain to be incompetent to write specifications, although they may be excellent critics of those prepared by other people and can probably make many valuable suggestions.

On another page will be found the first part of a translation of the specifications prepared by Dutch engineers for a bridge to be built in Holland, which engineers of railroads in this country will find well worth studying as a model of what such an instrument should and can be if drawn up by entirely competent persons. It will be noticed that, all through, nothing is implied; everything is stated in the clear est and most explicit way. There is little room for misunderstanding; but a contractor, when he takes work under such specifications, knows precisely what he must do, and thus bids for poor material and workmanship will not be brought into competition with those made by contractors who furnish good material and do honest work.

What usually occurs when a contract is to be given, whether it is for a bridge, locomotives, cars, rails or rail fastenings, is, that specifications are very hastily prepared by a clerk or private secretary, aided and advised by a practical man. The clerk has usually only the most superficial knowledge of the subject, and the practical man is apt to think only of those things which have been the source of trouble to him in his previous experience. The writer remembers seeing specifications for locomotives prepared by a master mechanic in which he had specified with the utmost explicitness that before the holes for the crank-pins are bored in the wheels, the quartering machine should be carefully examined to see whether it was true and would bore the holes in the opposite wheels exactly at right angles to each other. His experience had evidently shown him that in some cases such machines are not correct, and that special attention is required to secure accuracy. This, of course, was all very well, and undoubtedly it is a point deserving of attention, but the rest of the specifications was woefully imperfect. There was little or nothing said about the proportions and construction of the boiler seams, or of the size and number and method of attaching the boiler braces, or the junction of the dome with the boiler, points which are more liable than any other to be neglected in locomotive construction. In many, in fact most, other points the descriptions and specifications were of the most superficial character. This man's attention had been directed to this one point, and in his mind it overshadowed all others, and he apparently had not been sufficiently accustomed to consecutive thinking and writing to take up the subject of the specifications and describe it comprehensively. This latter capacity is the one which a liberal education gives, and is an enormous advantage which educated men have over others. On the other hand, such practical questions as the one concerning the quartering machines would not be thought of excepting by persons of extended experience, who had encountered the practical difficulties, which are so many and so great, in the way of having any work done right. It is no uncommon thing to find in locomotive specifications some little, unimportant contrivance like an oil cup, the form of grate-bars or throttle lever, described with the greatest minuteness, while nothing at all is said of the proportions of the boiler or the system of screw-threads to be used.

A complete specification, in fact, should be a sort of summarized treatise of the particular work which it describes, in which all the practical deductions from the theoretical knowledge which is applicable to the structure should be stated in full, and all the practical difficulties in doing the work anticipated and provided for in the most minute detail.

After doing this, it must also be remembered that human negligence is unlimited and apparently illimitable. With the most carefully prepared specifications there always is great difficulty in having them carried out, and in the specifications of the Dutch engineers, the most distinct provision is made for the inspection of the work during its whole progress. Without this, it is usually impossible to have the provisions of a contract fulfilled either in its spirit or letter. This is due probably much oftener to negligence than to any intention to be dishonest on the part of the contractors. Workmen are indifferent, and foremen don't care or will not take the trouble to think, and whatever can be covered up is very apt to be sent away in an imperfect condition. There is usually no money which can be expended more profitably than that required to employ a competent person to inspect work during its progress. The fact that such a man is employed makes it none the less important, however, that the specifications should be full, clear and explicit, because, as has been said, no more common cause of disagreement occurs than that growing out of what one person regards as implied, but which is interpreted differently by the two parties concerned. If any one will look over the bridge specifications on another page, he will find that the duties of an inspector are very much simplified by the explicitness with which everything is described. If the specifications are sufficiently detailed, a mere reference to them will usually clear up any misunderstanding.

Persons who have money invested in a public work, like a railroad, very naturally feel inclined either to direct its expenditure themselves or else to appoint persons to do it. Of course no one has any right to object to this, but the mistake which is so often made is when persons without any special training assume to be judges and experts in matters of which they are entirely ignorant. They make contracts without knowing what to specify, and then get poor work from "tin-pan" engineers, who underbid those who are intelligent and do good and honest work. It is true that those who supply money have often been misled by those who claim to be experts but who have proved to be humbugs, and not a few capitalists have hastily come to the conclusion that all engineers are theorists, whose conclusions and advice are not to be trusted. These same people, if they are sick, would, however, not think of consulting anyone but a physician, although there are many quacks; or, if in trouble with the law, of taking a lawyer's advice, notwithstanding that there are many humbugs in the ranks of that profession. The same is true of engineering. If trustworthy legal or medical advice is sought, we go to those of reputation and experience in these professions. In the same way, the test of the reliability of an engineer is what he has done. If advice is sought about the construction of a stone bridge, the natural and rational thing to do would be to seek a man who had successfully built such structures. While he might be quite competent in doing and advising about that kind of work, he might be, and usually such men are, comparatively ignorant about the construction of iron bridges, which has now grown to be a specialty. If a railroad president wants to buy locomotives, his wisest plan is to have the specifications prepared by some one who has designed and built and operated locomotives successfully, and not appeal to his traffic manager to do such work. Only a practical car-builder can properly prepare the specifications for cars. The essential thing is, that the person whose advice and services are sought for such work should have the special knowledge which is needed, and in preparing specifications should be able to express that knowledge in writing.

It often seems to be assumed though, that a man who simply comes into personal contact with things in this way becomes "practical." Thus a bridge inspector who simply has to examine bridges and see that timbers are not decayed nor nuts unscrewed, and that the structure is properly painted, will be regarded as a practical and a safe adviser about bridge construction, while he may not have the remotest idea how the strains are transferred from the centre of a bridge to the ends, or how the parts should be fastened together. A locomotive runner or mechanic will secure the most implicit confidence because he has been accustomed to the companionship of locomotives, when he has not the remotest idea what the relation is which the size of the boiler should bear to the other parts of the engine, or of the way in which the valve-gear is made to perform its functions. To become thoroughly practical requires much more than simple personal propinquity to engineering work. A nurse in a hospital may be accustomed to the care of sick people for half a lifetime and yet be entirely unfit to prescribe for a patient; and the clerk of a court may listen to the trial of causes for years and yet be utterly unfit to give legal advice. It is also true that in neither the legal

nor the medical profession will a person become a trustworthy practitioner or adviser by study alone. It is practical experience, combined with intelligence and a well-trained mind, that makes the knowledge of a man in any profession valuable and his advice safe. If engineering work and contracts for railroad machinery and rolling stock were made under the advice and specifications of that kind of experts, there would be much money saved to railroad companies, and not nearly so much poor work done.

DEDUCTIONS FROM THE PENNSYLVANIA RAILROAD REPORT.

The Pennsylvania Railroad directory has the most commendable custom of presenting to its constituency, the stockholders, a report of the operations of the year a week before the annual meeting. This report is advertised in the Philadelphia newspapers and sometimes elsewhere, and of course, as the yearly history of the greatest of railroad companies, attracts general attention. We have been accustomed to publish a very large portion of it, with comparisons, analyses and comments, and have always found it a very instructive and interesting document. But the report published before the election, early in March, is only the report of the President, with the Treasurer's statement of the general account and list of securities owned. And this early publication of the President's report and the general attention which it attracts are apt to prevent due attention being given to the reports of the Comptroller and General Manager, which are annexed, when the report is published in pamphlet form, usually two or three months after the publication of the President's report in the newspapers. This is regrettable, because these neglected reports contain many details of the operation and the cost of operation of each of the several divisions of the Pennsylvania's system—doubtless one of the most skillfully and intelligently worked railroad systems in the world.

Below we purpose to call attention to some of the facts shown in these reports, in a somewhat desultory manner perhaps, but yet we hope with profit to our readers.

The cost of working is reported in much detail by the accounting department, under five general heads: "Conducting transportation," "motive power," "maintenance of way," "maintenance of cars," and "general expenses." There are 39 items under "conducting transportation" for the Pennsylvania Railroad Division, 18 under "motive power," 24 under "maintenance of way," 9 under maintenance of cars," and 9 under "general expenses," or 99 in all. The minuteness of the division may be judged by the fact that there are separate charges under conducting transportation for each of the following classes of employés: agents, baggagemasters, brakemen, clerks, conductors and train agents, dispatchers, labor at stations, superintendents, and switchmen. There is a division of each item between passenger and freight expenses—a division which has sometimes been ridiculed because it cannot be made exactly, but which is certainly often of great value for practical purposes, and can be made nearly enough for most such purposes. For the "Pennsylvania Railroad Division," which includes the main line of 358 miles between Philadelphia and Pittsburgh, with 21 branches from 1 to 85 miles in length, making an aggregate of 1,055 miles, 39 per cent. of the expenses were for conducting transportation, 28.8 for motive power, 20.3 for maintenance of way, 8.7 for maintenance of cars, and 3.2 for general expenses. These percentages of expenses are different on the other divisions, and as the amount of traffic and the proportions of passenger and freight traffic vary on these divisions, we compare them below. If there is any connection between the nature and density of the traffic and the expenses of the different departments, the reader may hunt it up. We give the average number of passengers and of tons of freight carried one mile *per mile of road* on each division as the measure of the traffic.

	Pa. R. R.	United of N. J.	Phila. & Erie.
Per mile of road—			
Passenger miles	135,690	383,734	43,285
Ton miles	1,416,870	686,676	1,165,719
Per cent. of expenses—			
Conducting transportation	39.0	44.2	31.7
Motive power	28.8	24.7	27.4
Maintenance of way	20.3	21.6	27.6
Maintenance of cars	8.7	8.3	13.3
General expenses	3.2	1.2	.....

Here it appears that the New Jersey lines have nearly three times as dense a passenger traffic but not half as heavy a freight traffic as the Pennsylvania Railroad Division; while the Philadelphia & Erie has less than one-third as heavy a passenger traffic per mile as the Pennsylvania, but a freight traffic only 17 per cent. lighter. It should be said in connection with the latter that the Philadelphia & Erie is all main line, while two-thirds of the mileage of the Pennsylvania Railroad Division is branches; but this only emphasizes the meagreness of the passenger traffic of the Philadelphia & Erie.

The difference in density of traffic will perhaps be more readily comprehended by a comparison of the average number of passengers and tons of freight carried each way daily (365 days in the year) over the whole mileage which the actual business was equivalent to:

	Passengers.	Tons freight.
Pennsylvania Railroad Division	186	1,941
United Railroads of New Jersey	523	941
Philadelphia & Erie	59	1,597

If now we count a passenger carried one mile equivalent to two tons of freight carried one mile, which is on a great many roads quite near the proportion of earnings and expenses, we have the relative rank of these divisions as carriers expressed as follows in ton-miles equivalent to freight and passenger traffic taken together: Pennsylvania, 2,313; United of New Jersey, 1,987; Philadelphia & Erie, 1,715.

This leads us to consider the relative importance of other roads as carriers, concerning which vague ideas prevail. Below we present the passenger mileage and tonnage mileage per mile of road of 33 different roads, for the last year reported, together with our assured equivalent total tonnage mileage per mile, which latter is given as the measure of the average total traffic of the whole mileage of the respective roads. We wish beforehand to caution the reader, however, that he is likely to be astonished at the rank of some of the roads. Our notions of a railroad's traffic are usually formed almost wholly from a knowledge, more or less definite, of the business of its main line, the traffic and perhaps the mileage of the branches being unknown and ignored. But it is evident that the average traffic of a road with a hundred miles of main line with 40 trains daily, and a hundred of branches, with two trains daily, will be but 21 trains a day, while our impressions come entirely, it is probable, from the line with the forty trains. Just about two-thirds of the Pennsylvania's mileage, one-half of the Erie's and more than one-half of the New York Central's are made up of branches, of greater or less importance, but all with insignificant traffic compared with that of the main lines. We are, unfortunately, not able to compare main line traffics, as they are not reported separately from those of the whole system. The Pennsylvania, however, last year reported the earnings of its main line, and if the traffic was in the same proportion (and it is probably in a somewhat greater proportion, because of receiving lower average rates), then it had in 1877 at the rate of 482 passengers and 5,033 tons of freight each way daily, or a total of 5,997 equivalent ton-miles, which it would be interesting to compare with the main line traffic of other leading roads. But below it is the traffic of the whole mileage worked by the several companies that is expressed by the figures, and the reader should bear in mind what the system consists of when he examines them:

Average Density of Traffic of Thirty-three American Railroads.—Carried each way daily per mile of road.

	Passengers.	Tons.	Eq'valent total tons.
1. New York Central & Hudson River	434	2,219	3,087
2. New York, New Haven & Hartford	999	354	2,352
3. Pennsylvania	186	1,941	2,313
4. Boston & Albany	446	1,355	2,247
5. Erie	245	1,596	2,086
6. Michigan Central*	298	1,467	2,063
7. Pittsburgh, Cincinnati & St. Louis†	195	1,616	2,006
8. United Railroads of New Jersey	523	941	1,987
9. Philadelphia & Erie	59	1,597	1,715
10. Lake Shore & Michigan Southern	161	1,257	1,579
11. Philadelphia & Reading	127	1,220	1,474
12. Atlantic & Great Western	93	973	1,159
13. Cleveland, Col., Cin. & Indianapolis	84	801	969
14. Providence & Worcester	264	387	915
15. Eastern (Massachusetts)	332	193	857
16. Columbus, Chicago & Ind. Central	75	600	750
17. Union Pacific	142	440	724
18. St. Louis, Vandalia & Terre Haute	128	438	694
19. Chicago, Rock Island & Pacific	85	488	658
20. Chicago & Alton	83	428	594
21. Chicago & Northwestern	80	420	580
22. Connecticut River	197	138	532
23. Illinois Central	63	449	465
24. St. Louis, Iron Mt. & Southern	67	325	459
25. St. Louis, Alton & Terre Haute—Belleville Line	75	308	458
26. Cheapeake & Ohio	28	368	424
27. Chicago, Milwaukee & St. Paul	56	264	376
28. Indianapolis, Bloomington & West'n	49	219	317
29. Missouri, Kansas & Texas	43	193	279
30. Texas & Pacific	46	160	252
31. Atchison, Topeka & Santa Fe	41	135	217
32. St. Louis & San Francisco	21	107	209
33. Richmond & Danville	35	90	160

The Pennsylvania's three systems all have high rank, it is seen, but not the highest; and the contemplation of the figures lead us away from the study of this company's business to the observation, which will probably be the first one made by many readers, that we find hopelessly bankrupt roads with a much heavier traffic than some of the soundest dividend-paying roads. The Atlantic & Great Western, for instance, has a tenth more passenger traffic and twice as much freight traffic as the Chicago, Rock Island & Pacific, which never fails to pay 8 per cent. dividends on its stock, except when it pays 10 per cent., as last year; and it is still more superior in traffic to the Chicago & Alton, the Chicago & Northwestern, the Illinois Central, and the Chicago, Milwaukee & St. Paul. The conclusion is, first, that traffic is but one function of profits, the others being rates and working expenses; and, second, that bankruptcy or failure to make dividends may be due to too great capital as well as to too small profits. In the case of the Atlantic & Great Western, everything combines to reduce profits except traffic and working expenses—absurdly low rates, and an absurdly great, a truly gigantic capital.

The above would be a digression if this were merely a discussion of the Pennsylvania report, but we have allowed ourselves a great deal of latitude, and give notice that we shall consider everything legitimate which is suggested by the report; which will enable us to include pretty much everything in the realm of railroading.

All this comparison of density of traffic of the two kinds on different lines arose, as the reader may have forgotten (and probably has), in the course of an examination of the proportions of the different classes of working expenses on the three divisions of the Pennsylvania Railroad. It appears from the table that the division with the heaviest and largest proportion of passenger traffic had the largest proportion of expenses for "conducting transportation;" that with the smallest, the least.

But whatever value there may be in a comparison of the different items of expense on the different divisions will be found better by a statement of amount of each item per ton and per passenger per mile. This is shown below, only for the easier reading of the decimals we have given the amounts for a passenger or a ton of freight hauled 100 miles, in cents and hundredths of a cent:

Expenses of Carrying a Passenger 100 Miles.

	Pa. R.R.	U. of N. J.	P. & E.
Conducting transportation	69.27	86.70	120.90
Motive power	39.23	47.53	71.40
Maintenance of way	34.69	41.06	108.68
Maintenance of cars	25.86	15.82	43.38
General expenses	6.02	3.26	.....
Total	175.07	194.37	344.36

Expenses of Carrying a Ton of Freight 100 Miles.

Conducting transportation	21.39	50.81	14.87
Motive power	16.97	29.00	14.11
Maintenance of way	11.30	25.49	12.85
Maintenance of cars	3.76	9.68	6.43
General expenses	1.74	0.91	.....
Total	55.16	115.89	48.26

In the President's report, the cost per passenger per mile is given as 1.67 cents on the United Railroads of New Jersey Division, instead of 1.94 cents, as shown above; but either this is a mistake, or some part of the New Jersey lines included in the accounts of the accounting department were not included: the division of the passenger expenses of that division by its passenger mileage gives the results in the table above.

The differences in the various items of expenses on the three divisions will bear study. Some of them seem hard to account for; but the fact that the utilization of the cars and trains is quite different on the different divisions will explain much. Something of this will be seen from the following statement of the average train loads, passenger and freight, on the several divisions:

	Average train loads. No. passengers.	Tons freight.
Pennsylvania Railroad Division	41.1	145.4
United Railroads of New Jersey	56.4	110.1
Philadelphia & Erie	28.8	188.0

This goes a good way to explain both the very high cost of passengers and the very low cost of freight on the Philadelphia & Erie. With an average train load just sufficient to fill half a car, passenger expenses are naturally heavy. But the freight-train load is, we believe, the heaviest average that we have seen reported by any road, and this on a road which has a long and exceptionally heavy grade. Consolidation engines, which are used extensively on this line, account for the heavy load, and apparently have much to do in accounting for the low cost—the lowest reported by any railroad in the world, so far as our observation goes, though there is one in India which reports nearly as low a rate. We have at hand no accounts of this line for previous years, which would show the progress that has been made in increasing freight-train loads, but on the Pennsylvania Railroad Division the averages have been for the past nine years:

Year.	Tons.	Year.	Tons.
1869	109.0	1874	120.6
1870	112.2	1875	126.2
1871	102.7	1876	132.2
1872	109.8	1877	145.4
1873	110.3		

The average expense per ton per mile has decreased as these average loads have increased.

There are many more things given in or suggested

* The last report of the Michigan Central, from which these figures are deduced, is for the last seven months of 1877, during which freight traffic was extraordinarily heavy, while in the earlier part of the year it had been very light.

† All but a few miles of this road is main line.

by this report which we had intended to discuss, but we find that we cannot do them justice this week without trespassing on the patience of our readers, and therefore dismiss the subject abruptly, hoping to return to it again soon.

Distribution of Grain Receipts at Atlantic Ports.

The receipts of grain at the seven Atlantic ports for the eight months from Jan. 1 to Aug. 31 for the past two years, in bushels, with the percentages of the total received at each port, have been as follows:

	1878.		1877.	
	Bushels.	P. c. of total.	Bushels.	P. c. of total.
New York	73,533,640	47.3	35,038,292	41.4
Boston	12,590,954	8.1	7,974,213	9.4
Portland	1,500,754	0.9	766,443	0.9
Montreal	7,681,718	4.9	5,318,057	6.3
Philadelphia	25,446,810	16.4	11,745,670	13.9
Baltimore	26,360,900	17.0	18,522,784	21.9
New Orleans	8,334,792	5.4	5,212,931	6.2
Total	155,449,568	100.0	84,578,390	100.0

New York and Philadelphia alone show an increase in the percentages of the total received, and the greatest decrease continues to be at Baltimore, though for the past six weeks it has been receiving an unusually large proportion of the whole.

The percentages of receipts at Philadelphia and Baltimore taken together compared with that of New York appears as follows:

	1878.	1877.
New York	47.3	41.4
Philadelphia and Baltimore	33.4	35.8
Three ports	80.7	77.2

New York and Boston together compare as follows with Philadelphia and Baltimore together:

	1878.	1877.
New York and Boston	55.4	50.8
Philadelphia and Baltimore	33.4	35.8
Four ports	88.8	86.6

There has been a considerable change since navigation opened, New York during the four months that navigation was closed last winter having got 40.8 per cent. of the grain against Philadelphia's 19.5 and Baltimore's 20.9. But since navigation opened there has been a change, occurring since the new crop began to come forward. This will be indicated by the following comparison of receipts for the four weeks from Aug. 4 to 31, below:

	1878.		1877.	
	Bushels.	P. c. of total.	Bushels	P. c. of total.
New York	13,980,005	52.6	8,894,252	51.0
Boston	2,087,015	7.8	1,323,207	7.6
Portland	34,245	0.2	35,850	0.2
Montreal	9,009,570	7.6	1,534,279	8.8
Philadelphia	3,566,700	13.4	2,231,830	12.8
Baltimore	4,539,400	17.1	3,100,700	17.7
New Orleans	356,795	1.3	333,680	1.9
Total	26,583,730	100.0	17,453,798	100.0

Baltimore's proportion from the opening of navigation till July was but 12.4 per cent. of the total, while Philadelphia's was 17 per cent., and New York's a trifle more than 50 per cent. Since that time, Philadelphia and Baltimore seem to have changed places in the rank of grain receivers, without, in the slightest degree, having affected the New York receipts, its proportion having increased instead of decreasing while Baltimore was advancing its position.

The great pressure of grain at present, while navigation is open, is greatly in favor of New York, but the higher water rates are against it. A very large proportion of the grain this year has come to New York by lake to Buffalo and thence by rail. This route is equally open to Philadelphia, but it seems not to take advantage of it, and the Pennsylvania's line also makes deliveries at Baltimore by this route.

Broad Claims for Narrow Gauge.

Mr. Joseph Ramsey, Jr., Superintendent, and we believe Engineer, of the Bells Gap (narrow-gauge) Railroad, who, it may be remembered, read the ablest paper at the late Narrow-Gauge Convention that was presented at that assemblage, has written a letter to the Osceola *Reveille*, in which he makes the following claims:

"First, That a narrow-gauge road can be built and successfully operated where a broad gauge cannot.

"Second, That it can be built for from one-half to two-thirds the cost of the broad gauge.

"Third, That it has equal capacity with the broad gauge at about two-thirds the cost of operation."

It would be interesting to know precisely what so able an engineer as Mr. Ramsey had in his mind when he wrote these "claims." Does he, for example, mean by the first claim that a narrow gauge can be built in a "rough country" when a broad-gauge road could not be built for purely physical or mechanical reasons, or does he mean that, owing to cheapness of construction and cost of operation, a narrow-gauge road can be made to pay where a broad-gauge road would not?

Both of these claims are disputed.

In the second claim does he mean that a narrow-gauge road with *light* rails and rolling stock and *sharp* curves can be built for one-half to two-thirds the cost of a broad-gauge road with heavy rails and rolling stock and easy curves; or does he mean that a broad-gauge road giving the same facilites for carrying the traffic as a narrow-guage road would will cost from one-half to two-thirds more than the latter? The great difference of opinion which exists between the advocates of the narrow gauge and the unbelievers of their doctrines is chiefly due to the ambiguity with which this branch of the subject has been presented.

In making the third claim, does he mean that the cost of carrying freight per ton per mile and of passengers per mile with a heavy traffic on a narrow-gauge road is only two-thirds what it would be on one of a broad gauge, or does he mean that this will be the case with a light traffic only? If either of these assumptions is true, it is the most important discovery in engineering made since Stephenson's time, and the one, if correct, will ultimately compel all the owners of standard or broad-gauge roads to narrow them, and the other would be a sufficient reason for building all roads with a light traffic of a narrow gauge.

If Mr. Ramsey would state his claims a little more explicitly, it might perhaps be possible to clear away some questions which are now disputed.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Corpus Christi, San Diego & Rio Grande.—Extended from Banquete, Tex., west to Collins, 15 miles. It is of 3 ft. gauge.

San Francisco & North Pacific.—The *Sonoma & Marin Branch* is completed from Petaluma, Cal., south to San Rafael, 22 miles.

This is a total of 37 miles of new railroad, making 1,160 miles completed in the United States in 1878, against 1,176 miles reported for the corresponding period in 1877, 1,467 in 1876, 702 in 1875, 1,006 in 1874, 2,455 in 1873, and 4,498 in 1872.

CHICAGO GRAIN RECEIPTS have been recently the largest in its history, and much the largest ever known at this season of the year. Last year there was a very large August business, but this year it is 40 per cent. greater than ever. But it will be an error to assume that all the roads carrying to Chicago are doing much better than last year. Some of them are doing much worse. Last year the receipts were chiefly spring wheat and corn; this year they are corn and winter wheat. The spring wheat comes chiefly from the country northwest of Chicago, which exports very little corn; the winter wheat almost exclusively from the country southwest, which also ships nearly all the corn received in the Chicago market (and elsewhere). The change in the sources of wheat receipts is shown below, where the receipts by each route during the month of August for the past two years are given:

	1878.	1877.	Inc. or Dec.		P. c.
Chicago, Milwaukee & St. Paul	8,300	19,530	D.	11,230	57.6
Chicago & Northwestern	299,525	567,082	D.	267,557	47.2
Chicago, Burlington & Quincy	1,176,156	399,700	I.	1,223,544	306.0
Chicago, Rock Island & Pacific	542,150	422,274	I.	119,876	28.3
Chicago & Alton	465,285	48,800	I.	416,485	853.4
Illinois Central	380,174	128,323	I.	251,851	196.0
Other roads	59,885	764	I.	59,121	....
Total	2,931,475	1,586,473	I.	1,345,002	84.8

Thus the change in the sources of the wheat receipts is more remarkable even than the great increase, and this would be still more striking if the Milwaukee receipts were included, which are chiefly by the Chicago, Milwaukee & St. Paul, whose grain business at Chicago is usually but a trifling fraction of its Milwaukee grain business. But taking the Chicago receipts by themselves we see that the two roads to the Northwest, carrying chiefly from Wisconsin, Minnesota, Northern Iowa and Northern Illinois, in August of last year brought to Chicago 37 per cent. of its total wheat receipts, and this year but 10½ per cent.; while the proportion of the Chicago, Burlington & Quincy increased from 25 per cent. in 1877 to 40 per cent. in 1878, that of the Chicago & Alton from *three* per cent. to 16 per cent., and that of the Illinois Central from 8 per cent. to 13 per cent. The business has been done by the roads to the southward, whose traffic in this grain has been wonderfully large this year. The Chicago, Burlington & Quincy receipts in August of this year have been nearly one-third as large as its total receipts in the year 1877, and even then it delivered 25½ per cent. of all the wheat received in Chicago, but was vastly surpassed by the Northwestern, over which nearly 47 per cent. of the total Chicago receipts arrived. The former road, however, has perhaps most of the Spring wheat of Nebraska to carry, and a very large share of the Kansas crop.

It thus appears that the increased business of this crop year benefits especially a certain class of the railroads, while others, so far, are not doing nearly so well as last year.

THE ELEVATED RAILROADS in New York are looked upon by many as mines of wealth, and perhaps they are, or will be; but the record of their operations heretofore does not prove it. Only the New York Elevated, with its Greenwich street and Ninth avenue line, has been worked long enough to make an annual report, but that road, in the year ending with September, 1877 (during the whole of which it was open throughout, but did not have the whole of its second track and was not able to run quite so many trains as it now does), earned $303,209 gross, and $113,656 net; its working expenses being just about 62½ per cent., and the expense per passenger carried, 6¼ cents. Then it received 10 cents fare at all times of the day; now for four hours when traffic is heaviest it receives but 5 cents, and probably fully one-half of the whole number of passengers are carried at the 5-cent rate, making the average rate not more than 7½ cents. Evidently a very large increase in traffic will be necessary to make this line an extraordinarily profitable one. In the year referred to there were 3,011,863 passengers carried, or an average of 8,252 per day, and this number was just about one-half greater than the traffic of the preceding year. For eleven months of the current year, the number of passengers has been 3,204,820, and nearly 30 per cent. greater than for the same period of 1876-77, being at the rate of 9,622 per day. The cost of the road Sept. 30, 1877, which was before the second track was completed, was reported to be $2,843,588, and the net earnings of the previous year were equivalent to just about 4 per cent. on that amount. This would be very encouraging as the result of the beginning of a rapidly growing traffic, and it is very encouraging for the two new lines of vastly greater traffic that have been opened this year. But these, we must remember (and the old road now also), must make their profits from something like an average rate of 7½ cents per passenger, instead of the 10 cents which the Ninth avenue road has hitherto had. And the average expense of 6¼ cents per passenger is not very encouraging to any body. Undoubtedly, however, this will be reduced largely whenever and wherever the traffic is much larger. The station expenses are about the same with a large as with a small traffic, and also those for maintenance of road; but the train expenses vary very closely with the traffic, as the average train loads apparently cannot be much increased.

WATER RATES have changed less during the past week than for some time previous. Lake rates have been a little lower, generally, apparently from 4 to 4½ cents for corn, and a quarter of a cent more for wheat from Chicago to Buffalo, against 4¾ and 5 on Tuesday of last week. Shipments are so enormous that it would seem that rates would be forced higher, especially as the railroads are not competing very strongly for them, but taking little or no more grain than when the shipments were a third smaller. Evidently there is a vast tonnage on the lakes which the present remunerative rates are calling out.

Canal rates are quoted the same as a week ago in wheat and a quarter of a cent higher for corn and oats—that is, 8 cents, 7 and 4¾, respectively, from Buffalo to New York. The rail rates are now 8, 7½ and 5, or nearly the same as the canal rates, and the railroads are getting all they have cars for. It has been a feature of this season's business that the competition of the railroads with the lakes has been much less, at least less effective, than in some other seasons, especially in 1876; but the competition of the railroads with the canals has been continuous and effective. The New York Central especially has carried enormous quantities of grain from Buffalo that arrived there by lake. As canal rates are usually twice as high per mile of rail distance as lake rates, this is only natural. Just now the canal is unusually busy, as well as the railroads, but most of the season the canal boats would have been glad to get the grain that went by rail.

Ocean rates seem unchanged. Grain by steam from New York to Liverpool was taken on Tuesday at 6d. per bushel, but to Havre 19 to 20 cents was the rate, and about 6s. per quarter (9d. per bushel) seems to be the commonest rate by sail to Cork for orders, with very little difference (some higher, some lower) in charters from Philadelphia and Baltimore.

THE ERIE CANAL has had a larger merchandise traffic this year than for many preceding seasons. The whole amount of the traffic which the railroads usually have had pretty much to themselves of late years, but which has gone to the canal this season, is not, however, any considerable portion of the whole railroad traffic in such articles. An examination of the clearings indicates an increase in the canal shipments of such articles this year of about 40,000 tons, the canal having been open 23 days longer. The most notable diversions from the railroads are of sugar, molasses, domestic woolens and domestic cottons, of which the shipments amount to 46,511 tons this year against 9,584 last year. The canal boats take all such freights from New York to Buffalo, we believe, at about 60 cents per *ton*, or three cents per hundred; and there are propellers in the grain trade that are glad to get anything for a cargo from Buffalo to Chicago at almost any rate. But the merchandise shipments do not all go through by any means, nor are all of them west-bound. Some of them are to local points on the canal, where they compete with local rates of the New York Central and the Erie; some of them are products of interior manufactories going to New York or other distributting centres to be sold. Meanwhile there has been a great decrease in the provision shipments eastward by canal. This was much talked of last year, but it never did really amount to much, and this year it has almost disappeared—down to September amounting to but 2,636 tons, against 10,022 last year. The articles which go forward by canal are chiefly staples of moderate value per pound, which will not suffer by waiting and can be handled with little danger of injury.

BALTIMORE GRAIN TRAFFIC has been made up by the *Journal of Commerce* of that city for the crop year ending with August. It shows an increase in receipts this year, compared with last, of about 10,500,000 in grains of all kinds, or about 37½ per cent. This, however, is not more than the average rate of increase in receipts at all the Atlantic ports, and not so great as the rate of increase at New York for the same time. But the most notable feature of the year in the Baltimore grain business has been the great increase in wheat receipts from 4,693,591 to 15,987,260 bushels, or 240 per cent. This is important because Baltimore never had a really heavy wheat business before—never in any calendar year much more than half as much as for this last crop year. And now it is receiving wheat much faster than last year even, and promises for the current crop year to exceed the business of 16,000,000 bushels which it did in the last one.

Baltimore being a comparatively small city, and serving as a distributing centre for a much smaller population than some other grain markets, an unusually large proportion of

its receipts are exported—last year nearly 35,000,000 bushels, or fourteen-fifteenths of its receipts. Its business, however, was not remarkable, considering the general growth in grain receipts and shipments, and for the first half of this year, and especially after navigation closed, it fell far below the rank which it held the previous year.

About three-fourths of the grain receipts at Baltimore arrive by the Baltimore & Ohio Railroad, the other fourth coming from the Northern Central.

AUGUST EARNINGS so far reported (we have them this week for 14 roads) are perhaps more encouraging even than for the months immediately preceding; but they do not appear so, from the fact that August was on many roads a month of exceptionally heavy traffic last year, while the preceding months the traffic was light. Six of the 14 roads that report show a decreased traffic this year, and the injury to the spring wheat crop is reflected by decreases of 8.1 per cent. on the Burlington, Cedar Rapids & Northern, of 22.8 on the Chicago, Milwaukee & St. Paul, and of 22.8 per cent. on the Iowa lines of the Illinois Central, these three roads, with the Chicago & Northwestern and the Southern Minnesota, being just those on which spring wheat forms a large proportion of their traffic. Eleven of these roads reported their earnings in 1876, and only two of them—the Chicago, Milwaukee & St. Paul and the Toledo, Peoria & Warsaw—had larger earnings in August that year than this. At that time passenger earnings were generally largely increased by the Centennial traffic, but the grain shipments were then unusually light after July.

TRUNK LINE TRAFFIC, at least that part of it which moves eastward, seems now about as heavy as the roads can provide for with their present stock of cars. Grain, provisions and petroleum are all coming forward in great quantities—much greater than usual at this time of year. The New York Central is especially crowded; and as rates are pretty fair—in comparison with recent figures very good, indeed—the outlook is very encouraging for accumulating profits wherever the roads are prepared to carry economically, for rates are still so low that it is only the lines which can work very cheaply that can make any considerable profit even from a large traffic. In the West, where many of the roads are little affected by the competition of lake and canal and the through rates, and so are able to maintain a profitable rate, the present enormous business must be yielding very handsome profits—the largest, probably, for the favorably situated lines that they have had since 1873. They will be welcome, and may serve to offset the many dull months that most of them have had to pass through.

THE COST OF FUEL is now low on several American railroads, but there are certainly very few which can get coal as cheaply as many in England can. In his speech at the late half-yearly meeting, Mr. Ellis, Chairman of the Midland Company, one of the greatest in England, said that the price had now got down to an average of about six shillings per ton, which is about $1.46 for 2,240 lbs. In 1873, the average cost on this same road was just *three times* as much.

Logging Railroads.

A good deal has been said and written this season about tramroads for hauling logs. During the past month your correspondent has been over a good portion of the logging sections of Wisconsin. What he saw and learned from conversation with different operators on different streams will be made the subject of this letter. In view of the fact that the Wisconsin pineries were visited the last winter with the least amount of snow which has been known to fall for many years, and the consequent hanging up of a large portion of logs, and advance in the price of lumber, the lumbermen and loggers have set their wits at work to devise means for getting their logs, and as many of them as possible, to their mills. All sorts of artificial roads, constructed in all sorts of ways, have been tested on the various streams tributary to the Mississippi River. The favorite method has been to construct a road, the rails of which are round poles, which necessitate the use on the cars or trucks of concave wheels. The motive power is horse flesh; and the method is regarded both as a success and a failure, according to the man you talk with. In building such roads, such a variety of circumstances have to be taken into account that the success of one in one locality is no guarantee that it will be a like success in another. In the whole state of Wisconsin, the building of a logging railroad has not been undertaken on such a scale as the one now operated by Hazelton & Gerrish on the Muskegon River, in Michigan; consequently, hauling logs by rail in this region has not been as much of a success as those gentlemen have found it. The result of my investigations among Wisconsin operators shows, in their opinion, that where the length of the haul is one mile, or less, the cheapest way to secure the logs in summer is by the use of low-wheeled trucks, with four-inch tires. Of course, in any section where the nature of the ground is low or swampy, the road must be corduroyed; and if the track for the teams can be filled with sawdust, so much the better. Where the haul is more than a mile in length, the tramroad is the cheapest; and if it is more than four miles, and there is a sufficient quantity of lumber to justify it, the steam locomotive is to be preferred. I find many who are of the opinion that for more than a two-mile haul the locomotive is the cheapest in the end.

The experiment of using a locomotive on a wooden tramroad has been tried on the Wisconsin Central road by W. H. Blades, of Dorchester. After spending considerable money and wasting no little valuable time, he abandoned the locomotive as a failure. My opinion is that the experiment failed because the road was not built well enough to successfully use the locomotive. In order to do so, the road-bed must be made at least moderately solid. In fact, the error among loggers seems to be that, for such purposes as theirs, any kind of a road will do. This is not so any more in their case than in that of our ordinary traffic railroads. Owing to the spring of the poles under the drawing weight of the locomotive, everything about the engine must be made loose jointed, and as loose joints are not conducive to the successful operation of a steam engine, experiments in that direction are likely to prove failures. Messrs. Lamb & Richardson, at Spencer, on the same line, have also been testing a locomotive somewhat differently constructed, but with, so far, indifferent success. They are now placing upon their road trucks with wheels flanged in a different manner, and hope to be more successful. The Eau Plaine Lumber Company, at Rundle's mill, is now building a four-mile railroad, using sawed ties, which are laid on the ground eight or ten feet apart. On them are laid stringers of pine timber of different sizes, flattened at both ends to eight inches. On these strings a 3×4 in. hardwood rail is laid, care being taken to break joints. The stringers are pinned to the ties with 1½ in. wooden pins, while the rails are spiked down with 6 in. boat spikes. An ordinary locomotive will be used, the wheels of which, as well as those of the trucks, will be flanged. This experiment is looked upon with considerable interest in this section. Had the company used a light iron T rail, I think, it would have been more successful and cheaper in the end.

These tramroads, of from one to four miles haul, have been successful only where there has been great care taken in the construction of them. The route must be made as straight as possible, and great care must be exercised in laying the poles. The cost should range all the way from $225 to $300 per mile, owing to the character of the route. Experience shows that any cheaper roads have to be practically rebuilt about once in 60 days. The usual load for two horses is 1,500 feet of logs for hauls of a mile or less. * * *

One thing may be considered certain, as a general principle, at least, in this business, and that is that the more money that is spent on a road and in its equipment, in the first place, the more successful will be the experiment, and the smaller the expense of putting in the logs.—*Correspondence Northwestern Lumberman.*

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Louisville & Nashville, annual meeting, at the office in Louisville, Ky., Oct. 2.

Eastern, in New Hampshire, special meeting, in Portsmouth, N. H., Sept. 17. The meeting is called to vote on certain amendments in the lease to the Eastern, of Massachusetts; also to decide whether changes shall be made in the leases of the Portmouth, Great Falls & Conway and the Wolfeboro roads.

Southern Railway & Steamship Association, annual meeting, in Atlanta, Ga., Oct. 2.

Dividends.

Dividends have been declared as follows:

New York Central & Hudson River, 2 per cent., quarterly, payable Out. 15. Transfer books will close Sept. 16.

Lehigh Valley, 1 per cent., quarterly, payable Oct. 15. Transfer books will close Sept. 23.

Western Union Telegraph, 1¼ per cent., quarterly, payable Oct. 15. Transfer books will close Sept. 20.

Railroad Conventions.

The *General Time Convention* will hold its fall session at the Grand Pacific Hotel, Chicago, Oct. 10.

The *Railroad Claim Agents' Association* will meet at the Planters' Hotel, St. Louis, Oct. 15.

The *Southern Time Convention* will hold its fall session at the Windsor Hotel, New York City, Oct. 17.

The annual convention of the *Brotherhood of Locomotive Engineers* will be held in Indianapolis, beginning Oct. 16.

The *Master Car Painters' Association* will hold its ninth annual convention at the Forest City House in Cleveland, O., beginning on Wednesday, Sept. 18.

The *Narrow-Gauge Convention* will meet, pursuant to adjournment, in Cincinnati, Oct. 23.

The next regular meeting of the *American Institute of Mining Engineers* will be held at Lake George about the first of October next.

Foreclosure Sales.

The sale of the *Montclair & Greenwood Lake* road has again been postponed, from Sept. 7 to Sept. 14.

The sale of the *Indianapolis, Bloomington & Western, Main Line*, has been postponed from Aug. 31 to Oct. 1, at Bloomington, Ill. The postponement, it is understood, was made at the request of the bondholders' committee.

The *Cherokee Railroad* is now advertised to be sold in Cartersville, Ga., Nov. 5, under a decree of the United States Circuit Court. The sale will include all the property except certain personal property now in possession of the Receiver; terms will be $5,000 cash on the day of sale, the balance in three equal installments at 30, 60 and 90 days, with 10 per cent. interest. The road is completed from Cartersville, Ga., to Rockmart, 23 miles.

Brotherhood of Locomotive Firemen.

The fifth annual convention of the Grand Lodge of the Brotherhood of Locomotive Firemen met in Buffalo, N. Y., Sept. 10. Delegates were present representing 85 lodges, with the officers of the Grand Lodge. After opening the proceedings with prayer, an address of welcome was delivered by the President of the City Council, and responded to in an appropriate manner. Master Mechanic Wilder, of the New York Central, then made a short address, after which Grand Master F. B. Alley, made an address setting forth the work and objects of the association. The Brotherhood then went into secret session. The meeting is expected to continue several days.

East-Bound Pool Meeting.

The committee appointed at the Saratoga Conference met at the Grand Pacific Hotel, Chicago, Sept. 5, to consider the formation of a pool on east-bound freights. There were present Messrs. J. N. McCullough, Pennsylvania Company; H. D. Ledyard, Michigan Central; John Newell, Lake Shore & Michigan Southern; J. E. Simpson, Vandalia Line; H. B. Hurlburt, E. B. Thomas, Cleveland, Columbus, Cincinnati & Indianapolis; Wm. Duncan, Ohio & Mississippi; M. L. Doherty, Baltimore & Ohio; J. C. McMullin, Chicago & Alton; J. Tillinghast, Canada Southern; J. M. Osborne, Wabash, and F. A. Howe, Grand Trunk. Mr. McCullough was chosen Chairman and Mr. Duncan, Secretary.

A committee was appointed to consider what points should be included in the pooling arrangement, and reported the following points, the report being approved by the meeting: Milwaukee, Chicago, Quincy, Peoria, St. Louis, Louisville, Jeffersonville, Indianapolis, Dayton, Columbus, Detroit, Toledo, Cleveland, Cincinnati, Burlington, Hannibal, Lafayette, Logansport, Fort Wayne, Terre Haute and Defiance.

Another committee reported the following circular, which was adopted:

"At a meeting of the Executive Committee of Western railroads held this day to consider the subject of pooling through freight traffic from competing points in the West to through competitive points in the East, the following resolutions were adopted:

"First—That the following points shall be pooled points: Chicago, Milwaukee, Peoria, Burlington, Quincy, Hannibal, East St. Louis, Cincinnati, Louisville, Dayton, Columbus, Indianapolis, Detroit, Toledo, Cleveland, Fort Huron, Logansport, Lafayette, Fort Wayne and Terre Haute.

"Second—That tonnage originating from the pooled points shall be included in the tonnage from such named pooled points.

"Third—That the tonnage for five years, or as much less period of time as may be agreed upon, prior to July 1, 1878, be taken as the basis for determining proportions due to each road.

"Fourth—That the roads leading East from the several competitive points named be earnestly requested to have prepared at the earliest practicable date the statistics above required, that they may proceed to agree on the proceedings to be received by each of the roads interested.

"Fifth—That if they find themselves unable to agree on the proper proportions due to each, the question be referred to arbitrators, whose decision shall be binding on the parties.

"Sixth—That as the roads from the several points named come to agreement, they will report the name to the chairman of this meeting, who will, upon receipt of reports from all the points named, call a meeting of the committee to consider the same.

"Seventh—That this meeting shall be held at a date not later than Oct. 1.

"Eighth—That it shall consider, in addition to the foregoing, the date the pooling from the agreed points shall commence, together with the duration of the same, and the means and measures for carrying out all agreements relative to it."

On the following day it was decided to begin by pooling only at a few principal points, Chicago, St. Louis, Cincinnati, Louisville, Indianapolis and Peoria being designated, the minor points to be brought in gradually hereafter.

A complaint from the St. Louis lines that the Chicago lines carry 150 lbs. of baggage per passenger without extra charge, was referred to the General Passenger and Ticket Agents' Association.

A sub-committee reported that the Chicago, Burlington & Quincy had agreed to suspend the giving of stock passes for 10 days, pending the completion of a permanent agreement.

Southern Railway & Steamship Association.

A called meeting was held at the Kimball House, Atlanta, Sept. 5. Hon. Joseph E. Brown, President, was in the chair, and C. A. Sindall, Secretary, and the following roads represented:

Western & Atlantic, J. E. Brown, President; Wm. McRae, General Superintendent.

Central Railroad & Banking Company, W. M. Wadley, President; Wm. Rodgers, General Superintendent; Gen. G. M. Sorrell, Director.

Boston & Savannah Steamship Company, Wm. Rodgers.

Savannah, Griffin & North Alabama, Ocean Steamship Company, Mobile & Girard, Gen. G. M. Sorrell.

Macon & Brunswick, G. W. Adams, General Superintendent.

Georgia Railroad & Banking Company and Macon & Augusta, E. P. Alexander, President; E. R. Dorsey General Freight Agent.

South Carolina, S. S. Solomons, General Superintendent; J. M. Selkirk General Agent.

Port Royal Railroad, R. G. Fleming General Superintendent; J. S. Davant, General Agent.

Savannah & Charleston, C. S. Gadsden, General Superintendent.

Richmond & Danville and Charlotte, Columbia, & Augusta Railroad, T. M. R. Talcott General Superintendent.

Western Railroad of Alabama, C. Gabbet General Manager; S. D. Hubbard, Jr. General Freight Agent.

Atlanta & West Point, L. P. Grant Superintendent; A. J. Orme, General Freight Agent; F. Phinizy, W. B. Berry and D. N. Speer, Directors,

Selma, Rome & Dalton, Ray Knight, General Freight Agent.

Atlanta & Charlotte Air Line, G. J. Foreacre, General Manager; R. D. Carpenter, General Freight Agent.

Louisville & Nashville and South & North Alabama, M. H. Smith, General Freight Agent.

Montgomery & Eufaula, A. J. Lane, Receiver; B. Dunham, Superintendent; Lyman Wells, Treasurer.

Jacksonville, Pensacola & Mobile and Florida Central, Charles Holmes, General Superintendent.

Virgil Powers, General Commissioner; John B. Peck, General Agent, and M. S. Freeman, Clearing-House Agent of the Association.

R. C. Robson, General Agent; T. E. Walker, Claim Agent of the Green Line.

Southwestern, of Georgia, W. G. Raoul, Superintendent.

Atlantic & Gulf, H. S. Haines, General Superintendent; J. L. Taylor, General Freight Agent.

East Tennessee, Virginia & Georgia and Memphis & Charleston, J. R. Ogden, General Freight Agent, and T. S. Davant, Assistant General Freight Agent.

Nashville, Chattanooga & St. Louis, George R. Knox, General Freight Agent.

Savannah River Steamboat Line, W. B. Barry, Agent.

The business of the meeting was to consider a new and uniform classification of freights prepared by General Commissioner Virgil Powers, in pursuance of instructions given at a previous meeting. After referring this classification by sections to committees, the Association adjourned until the next morning.

At the second day's meeting the reports of the various committees were received and the new classification was again referred to a committee, with instructions to report at the annual meeting, which will be held in Atlanta, Oct. 2. Proposed changes in rates were referred to another committee, to report at the same time.

The meeting then adjourned.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—Mr. Frank M. Smith has been appointed Purchasing and Supply Agent, with office at Topeka, Kan. Mr. R. C. Hawley is now Fuel Agent.

Atlanta & Charlotte Air Line.—Mr. R. D. Carpenter has been appointed General Freight Agent of this company, and entered upon the discharge of his duties Sept. 5. All correspondence relating to freight matters should be addressed to him at Atlanta, Ga.

Chautauqua Lake.—A circular announces the following officers for this road, late the Buffalo, Corry & Pittsburgh: President, G. F. Lewis, Mayville, N. Y.; Secretary and Treasurer, Wm. E. Lewis, Corry, Pa.; Superintendent, C. J. Hepburn, Oil City, Pa. Remittances will be made to, and drafts for balances drawn upon, Wm. E. Lewis, Treasurer, Corry, Pa. All matters relating to accounts, car mileage, etc., will be addressed to that officer.

The operating Department will be under the charge of the Superintendent, at Oil City, Pa., and all matters pertaining

to the general freight and passenger business, rates, etc., will be addressed to him.

Civil Engineers' Club of the Northwest.—At a meeting held in Chicago, Sept. 3, the old officers were reëlected for the ensuing year, as follows: President, W. Sooy Smith; Secretary, L. P. Morehouse: Executive Committee, S. S. Greeley, B. Williams

Connecticut & Passumpsic Rivers.—At the annual meeting in Newport, Vt., Sept. 4, the following directors were chosen: Stephen Foster, Stanstead, P. Q.; Lucius Robinson, Newport, Vt.; T. P. Redfield, Montpelier, Vt.; Alden Speare, Newton, Mass.; Emmons Raymond, Cambridge, Mass.; Gardner C. Brown, Amos Barnes, Warren K. Blodgett, F. A. Peters, Boston. The only new director is Mr. Peters, who succeeds John E. Lyon, deceased. The board reëlected Emmons Raymond, President; T. P. Redfield, Vice-President; N. P. Lovering, Treasurer; Elijah Cleveland, Secretary, H. E. Folsom, Superintendent.

Forty-first Parallel.—The directors of this new company are: Johnson M. Burge, Isaac B. Hyman, North Manchester, Ind.; Varnum J. Caid, Calvin C. Miller, Warsaw, Ind.; Wm. Elmendorf. Knox, Ind.: Beana Thomas, Leesburg, Ind.; Stewart Hyman, Terre Haute, Ind.; Charles W. Caid, Chicago.

Harrisburg, Portsmouth, Mt. Joy & Lancaster.—At the annual meeting in Philadelphia, Sept. 6, the following directors were chosen: Thomas A. Scott, George B. Roberts, James Magee, Wistar Morris, James M. Kennedy, Josiah Bacon, N. Parker Shortridge, James Young, Lewis Elkin. The road is leased to the Pennsylvania, forming part of its main line.

Louisville, Cincinnati & Lexington.—At the annual meeting in Louisville, Sept. 3, the old board was reëlected, as follows: F. P. Schmitt, Jacob Krieger, Sr., John B. Bangs, G. Spratt, George Ainslie, E. Thompson, Charles Tilden, Louisville, Ky.; Henry Bell, E. D. Sayre, M. C. Johnson, Lexington, Ky. The board reëlected James B. Wilder, President; F. P. Schmitt, Vice-President; S. S. Eastwood, Secretary and Treasurer; A. Barnett, Attorney; John McLeod, General Superintendent; Wm. Mahl, Auditor; S. S. Parker, General Passenger and Ticket Agent; Edgar Hill, General Freight Agent.

Massawippi Valley.—At the annual meeting in Rock Island, P. Q., Sept. 4, the following directors were chosen: Emmons Raymond, W. K. Blodgett, Gardner Brown, F. A. Peters, T. L. Terrill, Charles Brooks, R. M. Hall, Lucius Robinson, Stephen Foster. The board elected R. M. Hall, President; Charles Brooks, Vice-President; Stephen Foster, Treasurer. The road is leased to the Connecticut & Passumpsic Rivers Company.

Pittsburgh Southern.—At the annual meeting in Pittsburgh, Sept. 9, George P. Hays, of Washington, Pa., was chosen President, with the following directors: Joshua Wright, J. P. Miller, John W. Bayer, A. McMurray, Joseph Kammerer, Wm. Espy, Thos. McClelland, V. Harding, J. P. Donnelly, Wm. Frye, Wm. Thompson. There was a tie vote between Josiah Reamer and Joseph H. Phillips, which will leave a vacancy to be filled by the board. Mr. George P. Hays succeeds M. D. Hays, of Pittsburgh.

Western, of Alabama.—At a meeting held in Montgomery, Ala., Aug. 30, the joint committees from the Georgia and Central companies, after discussing several names, decided to appoint Mr. Cecil Gabbett General Manager of this road, in place of Gen. E. P. Alexander, now President of the Georgia Company. Mr. Gabbett has been Roadmaster for some time; he is a young man—only twenty-nine—and a few years ago was a brakeman on the Southwestern road. He has a somewhat difficult position to fill, the road being owned jointly by the Georgia and Central companies, whose interests are not always the same.

PERSONAL.

—J. W. Calder, Manager of the Dallas & Wichita road, was shot dead in Dallas, Tex., Sept. 4, by Mr. Rosser, a director of the company, in a street fight in which the Receiver and two other directors were also engaged. The fight arose from a chance meeting, followed by some discussion of the affairs of the road.

—Mr. W. S. Spiers, General Freight Agent of the Toledo, Peoria & Warsaw, was presented with a gold watch and chain, valued at $500, by a number of the business men of Peoria on Sept. 3. Accompanying the gift was a testimonial signed by a large number of citizens of Peoria

—Mr. G. Dawson Coleman, who died at his residence in Lebanon, Pa., Sept. 9, was one of the most prominent iron manufacturers of Pennsylvania. He owned a large iron property and furnaces at Lebanon, and was a large stockholder in the Pennsylvania Steel Company. His father and grandfather were iron makers before him.

—Gen. Wm. Sooy Smith, who has charge, as Chief Engineer, of the construction of the Chicago & Alton's new bridge over the Missouri at Glasgow, Mo., while in one of the caissons on Aug. 26, made a misstep and fell, breaking his collar-bone, a painful but not dangerous injury.

—Mr. Samuel Hays, lately appointed Postmaster at St. Louis, was formerly President of the Missouri Pacific and Vice-President of the Atlantic & Pacific, and is now a director of the St. Louis & San Francisco Company.

—Mr. Thomas Curtis Clarke, of the bridge-building firm of Clarke, Reeves & Co., has been awarded by the British Institute of Civil Engineers a Telford medal and a Telford premium for his paper on "The Design generally of Iron Bridges of very large Spans for Railway Traffic."

—Mr. L. F. Whitney, Secretary and Treasurer of the People's Railroad Company, and an old and respected citizen of Pottsville, Pa., died in that place Sept. 11.

—The New Hampshire Republicans have nominated for Railroad Commissioners G. P. Conn, of Concord, D. E. Willard, of Oxford, and James L. French, of Moultonboro. Usually only one is elected each year, but a change in the State constitution requires the election of an entire new board. Messrs. Conn and Willard are now in office.

TRAFFIC AND EARNINGS.

Petroleum Exports.

For the eight months from Jan. 1 to Aug. 31, the exports of petroleum from the leading Atlantic ports have been:

	1878.	1877.	1876.	1875.
New York	137,487,459	166,973,705	89,441,385	98,873,817
Boston	1,896,834	3,067,354	1,852,340	1,695,792
Philadelphia	32,060,114	27,925,257	42,294,564	37,240,824
Baltimore	22,340,959	26,479,690	26,489,104	18,219,821
Richmond	.....	.....	4,082,400	.....
Portland	214,853	1,392,344	.....	.....
Norfolk	.....	.....	391,100	.....
Total	194,000,219	230,311,850	160,077,393	156,031,254

The exports this year are 16 per cent. less than last year but are 21 per cent. more than in 1876, and 17 per cent. more than in 1874, when the exports were the largest before 1877.

The percentage of the total exported from each of the chief ports for five years has been:

	1878.	1877.	1876.	1875.	1874.
New York	70.9	72.5	55.9	63.3	64.0
Boston	1.0	1.3	1.2	1.1	1.6
Philadelphia	16.5	12.1	26.4	23.9	32.2
Baltimore	11.5	11.5	16.5	11.7	2.2
Richmond	....	1.8	...	....	....
Other ports	0.1	0.8	....	....	....
Total	100.0	100.0	100.0	100.0	100.0

The change since last year is chiefly in transferring the exports of Portland, Norfolk and Richmond to Philadelphia, with a trifle from New York, leaving the latter city, however, with a much greater proportion of the exports than in any year previous to 1877. Compared with 1874, the changes have been immense. New York has gained 6.9 per cent., Philadelphia lost 15.7, or nearly half of its proportion of the whole, and Baltimore has gained 9.3, or has quintupled its percentage. The traffic appears to be an extremely fluctuating one.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Eight months ending Aug. 31:				
Bur., Ced. R. & No.	$992,881	$615,583	I. $377,298	61.3
Chicago & Alton	3,001,096	2,829,397	I. 171,699	6.1
Chicago, Mil. & St. Paul	5,428,000	4,190,812	I. 1,237,188	29.5
Denver & Rio Gr'de	678,894	464,985	I. 213,909	46.0
Grand Trunk	5,718,904	5,862,233	D. 143,329	2.4
Ill. Cen., Ill. lines	3,586,006	3,121,012	I. 464,994	14.9
" Iowa lines	953,362	819,661	I. 133,701	16.3
Kansas Pacific	2,153,013	1,925,249	I. 227,764	11.8
Missouri, Kansas & Texas	1,770,521	2,007,405	D. 236,884	11.8
St. Louis, Iron Mt. & Southern	2,527,478	2,583,626	D. 56,148	2.2
St. Louis, Kan. City & Northern	2,057,175	1,906,352	I. 150,823	7.9
St. Louis & S. E.	646,703	600,207	I. 46,496	7.7
Toledo, Peoria & Warsaw	836,161	694,136	I. 142,025	24.6
Wabash	3,139,922	2,879,099	I. 260,823	9.1
Seven months ending July 31:				
Chi., Bur. & Quincy	$7,364,218	$6,301,348	I. $1,062,870	16.9
Gal., Harrisburg & San Antonio	612,910	489,664	I. 123,246	25.2
Four Months ending July 31:				
Ogdensburg & Lake Champlain	$167,894	$198,319	D. $30,425	15.3
Net earnings	23,765	85,277	D. 61,512	72.1
P. c. of expenses	85.90	57.01	I. 28.89	50.7
Month of July:				
Chi, Bur. & Quincy	$946,427	$829,300	I. $117,172	14.1
Galveston, Har. & San Antonio	83,877	66,212	I. 17,665	26.7
Pitts., Titusville & Buffalo	39,973	53,687	D. 13,714	25.5
Net earnings	12,035	25,608	D. 13,573	53.0
P. c. of expenses	69.85	52.00	I. 17.85	34.3
Union Pacific	1,014,959	1,033,592	D. 18,633	1.8
Net earnings	628,612	507,739	I. 120,873	21.8
Per cent. of exps.	38.06	50.86	D. 12.80	25.2
Month of August:				
Bur., Cedar Rap. & Northern	$104,443	$113,625	D. $9,182	8.1
Chicago & Alton	563,728	491,728	I. 72,000	14.6
Chicago & Eastern Illinois	83,884	64,587	I. 19,297	29.9
Chi., Mil. & St. Paul	523,000	677,050	D. 154,050	22.8
Denver & Rio Gr'de.	119,700	84,572	I. 35,128	41.5
Ill. Cen., Ill. lines	562,190	564,889	D. 2,729	0.5
" Iowa lines	98,537	127,575	D. 29,038	22.8
Kansas Pacific	413,854	304,842	I. 109,012	35.8
Mo., Kansas & Tex.	294,835	323,347	D. 28,512	8.8
St. Louis, Iron Mt. & Southern	359,100	374,165	D. 15,065	4.0
St. Louis, Kan. City & Northern	309,103	302,026	I. 7,077	2.3
St. Louis & Southeastern	115,999	112,702	I. 3,297	2.9
Toledo, Peoria & Warsaw	131,145	121,274	I. 9,871	8.1
Wabash	577,940	531,222	I. 46,718	8.8
Week ending Aug 31:				
Grand Trunk	$175,208	$190,050	D. $14,842	7.8

Water Rates.

At San Francisco ocean freights have been low on account of the large amount of disengaged tonnage in port. A number of charters are reported recently at 40s. to 42s. 6d. per ton for wooden vessels and 47s. 6d. for iron vessels to load wheat for English ports, or from 26 to 31 cents per bushel. These are unusually low rates, 50s. to 60s. being the ordinary freight on wheat.

Coal Movement.

Coal tonnages are reported as follows for the eight months ending Aug. 31, the tonnage in each case being only that originating on the line to which it is credited:

	1878.	1877.	Inc. or Dec.	P. c.
Anthracite:				
Philadelphia & Reading	3,122,090	4,176,561	D. 1,054,471	25.2
Northern Central, Shamokin Div., and Summit Br. R. R.	366,098	401,721	D. 35,623	8.9
Danville, Hazleton & Wilkesbarre	18,311	13,719	I. 4,592	33.5
Pennsylvania Canal	210,285	226,093	D. 15,808	7.0
Central of N.J., Le'h Div.	1,453,185	1,791,253	D. 338,068	18.8
Lehigh Valley	2,086,998	2,552,150	D. 465,152	18.2
Penn. & New York	20,032	32,931	D. 12,899	39.2
Del., Lacka. & Western	1,326,632	1,311,352	I. 15,280	1.2
Del. & Hudson Canal Co.	1,333,439	1,284,546	I. 48,893	3.8
Pennsylvania Coal Co	538,636	698,269	D 159,633	22.9
State Line & Sullivan	20,620	8,982	I. 11,638	129.6
Total anthracite	10,496,326	12,497,577	D. 2,001,251	16.0
Semi-bituminous:				
Cumberland, all lines	945,929	867,917	I. 78,012	9.0
Huntingdon & Br'd Top	94,363	92,671	I. 1,692	1.8
East Broad Top	39,214	34,416	I. 4,798	13.4
Tyrone & Clearfield	821,058	891,916	D. 70,858	7.9
Bellefonte & Snow Shoe	15,646	25,641	D. 9,995	39.0
Total semi-bitu's	1,916,210	1,912,561	I. 3,649	0.2
Bituminous:				
Barclay	201,107	215,029	D. 13,922	6·5
Allegh'y Region Pa. R.R.	133,912	125,293	I. 8,619	6.9
Penn and Westmoreland gas coal	430,100	410,092	I. 26,008	6.3
West Pennsylvania R. R.	121,288	115,587	I. 5,701	4.9
Southwest Penn. R. R.	17,199	25,419	D. 8,220	32.4
Pitts'rgh Region, Pa. R.R.	260,149	221,962	I. 38,187	17.2
Total bituminous	1,169,755	1,113,382	I. 56,373	5.1
Coke:				
Penn and Westmoreland.	49,113	.....	.....	....
West Pennsylvania R. R.	55,281	.....	.....	....
Southwest Penn. R. R.	506,850	.....	.....	....
Pitts'rgh Region, Pa. R.R.	65,008	.....	.....	....
Total coke	676,252	503,241	I. 173,011	34 4

The anthracite trade is still reported very dull, with little demand from consumers.

Actual tonnage passing over the Pennsylvania & New York road for the nine months of its fiscal year from Dec. 1 to Aug. 31 was:

	1878.	1877.	Decrease.	P. c.
Anthracite	558,624	601,560	42,936	7.1
Bituminous	233,106	250,605	17,499	7.0
Total	791,730	852,165	60,435	7.1

Actual tonnage passing over the Huntingdon & Broad Top road for the eight months ending Aug. 31 was:

	1878.	1877.	Inc. or Dec.	P. c.
Broad Top coal	94,363	92,671	I. 1,692	1.8
Cumberland coal	83,967	95,892	D. 11,925	12.4
Total	178,330	188,563	D. 10,233	5.4

The Broad Top traffic originates on the line of the road; the Cumberland is received from the Bedford Division, Pennsylvania Railroad, at Mount Dallas and carried to the main line of that road at Huntingdon.

Coal shipments from Pictou, N. S., for the eight months ending Aug. 31 were 82,406 tons, a decrease of 32,381 tons, or 28.2 per cent., from the same period in 1877.

Grain Movement.

For the week ending Aug. 31, the receipts of grain of all kinds at the eight Northwestern markets of St. Louis, Peoria, Chicago, Milwaukee, Duluth, Detroit, Toledo and Cleveland have been, in bushels, for the past six years:

1878.	1877.	1876.	1875.	1874.	1873.
8,790,893	4,985,532	4,832,385	4,596,574	3,215,118	5,017,841

The receipts of the week this year were 77 per cent. greater than last year, and 74 per cent. greater than in any preceding year. Of the total this year, 53.3 per cent. was at Chicago, 15.9 at Toledo, 9.8 at Detroit, 8.3 at St. Louis, 5.4 at Milwaukee, 5.2 at Peoria, 1.1 at Duluth and 1 per cent. at Cleveland.

The shipments of the same ports for the same week were:

1878.	1877.	1876.	1875.	1874.	1873.
6,719,785	4,710,589	3,271,549	4,631,793,	3,826,206	3,642,064

This year the shipments are 42½ per cent. greater than last or any previous year.

Of the above shipments the number of bushels and the percentage of the totals shipped by rail have been:

1878.	1877.	1876.	1875.	1874.	1873.
1,275,462	1,146,301	1,573,058	1,520,811	1,233,049	776,740
18.7 p.c.	24.3 p. c.	48.2 p. c.	30.5 p. c.	32.2 p. c.	21.3 p. c.

The rail shipments are larger this year than last, but smaller than in either 1876 or 1875, when, however, the roads were carrying at very low rates. The rates for the week were the same this year as last. The proportion of the total is the smallest for six years, owing to the fact that the shipments by lake, 5,444,323 bushels, were the largest ever known—considerably more than twice as great as the average lake shipments this season before August.

The receipts at the seven Atlantic ports for the same week were:

1878.	1877.	1876.	1875.	1874.	1873.
7,189,228	4,846,140	3,371,266	4,145,143	2,435,103	2,735,156

The receipts this year are 48 per cent. greater than last or any previous year, and are the largest that ever have been reported for any week of any year. About five-ninths of them were wheat. Of the total 55.9 per cent. arrived at New York, 16.3 at Baltimore, 11.3 at Philadelphia, 8.4 at Montreal, 8 at Boston and 0.1 per cent. at Portland. New Orleans is credited with but 1,125 bushels, due doubtless to the epidemic.

The receipts of the Northwestern markets for the whole month of August have been, for five years:

1878.	1877.	1876.	1875.	1874.
37,658,879	24,334,611	19,660,829	18,214,649	20,861,192

For the eight months from Jan. 1 to Aug. 31 Northwestern receipts have been:

1878.	1877.	1876.	1875.	1874.
143,721,249	91,598,707	106,313,878	90,052,109	119,968,509

For the same eight months Northwestern shipments have been:

1878.	1877.	1876.	1875.	1874.
109,979,819	98,109,188	95,247,917	73,182,444	90,924,441

For the same eight months, receipts at the seven Atlantic ports were:

1878.	1877.	1876.	1875.	1874.
155,500,921	84,524,215	106,357,508	79,699,086	96,478,868

Compared with last year, in the eight months there has been an increase of 57 per cent. in Northwestern receipts, of 12 per cent. in Northwestern shipments, and of no less than 84 per cent. in Atlantic receipts.

Receipts and shipments at Chicago & Milwaukee for the week ending Sept. 9 were:

	Receipts.	Shipments.
Chicago	4,355,911	3,725,552
Milwaukee	501,500	322,340

For the same week the receipts and shipments at Buffalo were:

	Receipts.	Shipments.
By rail	643,800	1,584,085
By water	4,287,032	1,867,632
Total	4,930,832	3,451,717

And at four Atlantic ports the receipts for the same week were:

New York	4,232,713	Philadelphia	756,100
Baltimore	1,180,156	Boston	496,355

Of the New York receipts nearly 40 per cent. was by rail.

THE SCRAP HEAP.

Railroad Material for Brazil.

Messrs. Mitchell J. Asch & Co., of New York, have received notice of a heavy order for railroad material and equipment for a new road to be built from the coast of Brazil to the rich coffee district of the interior. The order will probably be filled here, provided prices and qualities are satisfactory, although great efforts have been made to take it to England. Full particulars will not be received until the arrival of the next steamer, near the end of this month.

A Queer Locomotive.

The following description of a locomotive on the Old Colony Railroad is from the Boston *Post* of Aug. 26:

"Of this machine it is said that it is constructed with a largely-increased fire-service in order to remove the difficulties arising from the consumption of coal in the ordinary locomotive. The consumption of fuel in the ordinary locomotive is at the rate of forty to fifty pounds per hour per square foot of grate surface, while in this engine, when doing its hardest work, the consumption is only sixteen pounds per hour. The fire-box is behind and on a line with, instead of under, the boiler, and while in the common locomotive the dimensions are 60 and 66 by 32 inches, the new design is 8 feet 6 inches long by 7 feet 6½ inches wide. The heating surface of the fire-box is 103 square feet; of the combustion chamber 26 feet. The grate-rest is between water bars, which prevent them from burning out, and the area is 64 feet. The diameter of the six driving-wheels is 54 inches, and above them are placed the boiler and fire-box. The cab is over the rear end of the boiler, while on top of the fire-box are seats, protected from the sun by an awning. The weight of the engine is 86,150. At the front end of the boiler is a revolving register, which, when open, has an area of six hundred square inches. On account of the free steaming qualities of the engine, it becomes necessary to open this register in order that the steam may pass directly to the stack without passing through the fire. The fuel used by this engine can be de-

livered in Boston at $2.25 per ton, or $1.50 less than the cost of fuel which is now used. As the fuel remains perfectly quiet in the fire-box, the consumption is slow, and although the engine has no spark-arrester, not a spark escapes from the stack; neither is there any annoyance from smoke and gas, which are consumed. Its construction ensures complete protection from fire, as no coals drop out on the track and no sparks are blown from the smoke-stack."

From the description, it seems to be a locomotive with a large fire-box for burning small coal, similar to those in use on the Reading road; but an engine which steams so freely that it is necessary to open a register in order "that the steam may pass directly to the stack *without passing through the fire*," must be a curiosity second only to one in which the steam does pass through the fire for either the opposite or any other reason. The engine is, in fact, one loaned by the Reading road to the Old Colony for a test.

OLD AND NEW ROADS.

Annapolis & Elkridge.—In the case of Harrison and others against this company, the Circuit Court for Anne Arundel County, Md., has decided that the objections to the constitution of the board of directors, by which the mortgage on the road was executed, are not sufficient to set aside the mortgage. The company was duly authorized by law to issue mortgage bonds, and the objections to the form of the mortgage are insufficient. Further, when a new board was elected, no attempt was made by it to stop the circulation of the bonds. It is also held that the death of F. W. Brune, one of the trustees, does not affect the proceedings as continued by the surviving trustee. The objection that the trustees began proceedings in Anne Arundel and filed bonds there, and afterward attempted to sell the road in Baltimore, thus placing themselves beyond the jurisdiction of the Court, is held to be good. The Court, therefore, dissolves the injunction so far as it prevents the trustees from taking possession of the road and continues it in so far as it prevents the road from being sold in the city of Baltimore.

Augusta, Knoxville & Greenwood.—The grading on this road is now finished from Augusta, Ga., northwest eight miles, and work is progressing to Walton Island, eight miles further. On the South Carolina side of the river, the 24 miles from Greenwood to Dorn's Mine are graded and a force is at work between Dorn's Mine and Walton Island.

Baltimore & Delta.—This road is now finally located from Baltimore to Forrest Hill, and the engineers are working northward toward Delta. The right of way into Baltimore has been secured on very favorable terms, and it is thought that the company will be ready to let contracts for the grading early in October. Subscriptions to the stock are said to be coming in so freely that the directors feel confident of their ability to have the road finished next summer.

Boston, Hoosac Tunnel & Western.—The Troy & Boston Company has begun suit in the United States Circuit Court to enjoin this company from building its road through Vermont. The complaint charges that the new road is parallel and close to the line through Vermont leased by the Troy & Boston and that its construction is practically a deprivation of the rights guaranteed by the lease, and further that it is built without proper authority and in contravention of the laws of Vermont.

Charlotte, Columbia & Augusta.—The Baltimore correspondent of the Charleston *News and Courier* says, under date of Sept. 4: "The sale of the controlling interest in the stock of this road recently owned by the Southern Security Company, was perfected yesterday to several parties who have combined for the purchase. These parties say that it will be for their interest to give the greatest amount of mileage to passenger and freight traffic, thus increasing the revenue of the road. While the former connections at Charlotte are to be restored, all others are to be retained. It will be their aim, they say, to improve the Charleston connection, and it is hoped that a through car from Charleston to New York, or at least to Richmond or Washington, may be put on to meet the wants of the fall and winter trade."

For some years the road has been worked in the interest of the Wilmington, Columbia & Augusta, business from both divisions being carried to Columbia, and there has been little through traffic carried to Charlotte and the roads northward from that place. The purchase of the stock is said to have been made in the interest of the Richmond & Danville Company.

Cincinnati Southern.—A dispatch from Cincinnati, Sept. 11, says: "The trustees of the Cincinnati Southern Railroad have served a notice upon the company now operating the road that the license granted to them last year will terminate at the end of the time agreed upon for such notice, unless it is sooner determined by a lease or forfeiture. It is probable that this will lead to a readjustment of the compensation allowed under the present arrangement, or the formation of a new company. The company have had a profitable contract, and their management had been such as to expand its business beyond expectation."

Clinton, Tipton & Iowa City.—This company has filed articles of incorporation in Iowa, and is apparently a reorganization of the Chicago, Clinton & Western, by the parties who bought that company's property at judicial sale.

Corpus Christi, San Diego & Rio Grande.—This road is now completed and opened for traffic to Collins, in Nueces County, Tex., 40 miles west of Corpus Christi, and 15 miles beyond the old terminus at Banquete. Daily trains are run through to Collins.

Des Moines & Knoxville.—Des Moines, Ia., has voted to levy a 5 per cent. tax in aid of this road, which is to extend from that city southeast to Knoxville, where it will connect with a branch of the Chicago, Burlington & Quincy. It will be about 33 miles long.

Duluth & Winnipeg.—Surveys are to be made for this projected line from Duluth, Minn., northwest to Winnipeg, Manitoba, about 300 miles. It is said that the projectors hope for assistance from the Wisconsin Central, and that they will extend their road from Duluth to Ashland, to connect with the Central.

Eastern, in New Hampshire.—The Boston *Advertiser* says in relation to the difficulties between this company and the Eastern of Massachusetts: "Last week a conference was held between the parties, and it was agreed to withdraw the suits on the one side and on the other to pay a dividend of 4½ per cent. on the New Hampshire stock ($22,500 per year), the payment dating back to June, 1877."

The Eastern Railroad in New Hampshire is leased to the Eastern of Massachusetts, the lease providing there shall be paid as rental the same dividends on the stock of the lessor company as on that of the lessee. As the lessee has paid no dividend for several years and has been, in fact, bankrupt, the New Hampshire company has received no rent, and two suits are pending to set aside the lease. The present arrangement appears to be an equitable one. The new lease or agreement will be submitted to the stockholders at a special meeting.

Forty-first Parallel.—A company by this name has filed articles of incorporation for a narrow-gauge road from the Ohio line in Allen County, Ind., due west across Indiana to a point on the Illinois line in Newton County. There is also to be a short branch to Bluffton, and a branch, called the Chicago Branch, from near the east line of the state west by north to a point in Fulton County. The whole length of road to be built is 230 miles; capital stock, $2,300,000.

Illinois Central.—The Land Department reports that during the month of August 656.70 acres of land were sold for $4,592.17. The cash collected on land contracts was $8,313.06.

The traffic on the lines in Illinois was $562,160 against $564,889.30 in August, 1877, a decrease of $2,729.30, or 0.5 per cent. There was a decrease on the Iowa Division of $29,038.50, making the total decrease in both States for the month $31,767.80.

Indianapolis, Bloomington & Western.—The Corbin Committee of bondholders give notice that the supplemental agreement of July 25 has been signed by holders of a large majority of both classes of first mortgage bonds, and deposited with the Central Trust Company in New York. All bondholders who desire to join in the purchase of the road must sign the agreement and deposit their bonds with the Trust Company before Sept. 28.

Kansas Pacific.—The United States Circuit Court has granted an order enjoining the further prosecution of the suits to foreclose the income mortgages begun by Jay Gould and others in the District Court of Douglas County, Kan. The petition for the removal of Henry Villard as one of the Receivers, has been postponed until next month, when argument will be heard upon it.

Lockport & Buffalo.—In Buffalo last week argument was heard on a motion to modify the order heretofore issued staying proceedings in relation to the crossing of the New York Central track at Tonawanda. Decision was reserved.

Macon & Augusta.—The Augusta (Ga.) *Chronicle* says: "Recently M. K. Jesup, of New York, one of the stockholders of the Macon & Augusta Railroad, filed a bill in the United States District Court, at Savannah, against the Georgia Railroad & Banking Company, the Macon & Augusta Railroad Company and Judge John P. King, individually, asking for the appointment of a receiver to take charge of the Macon & Augusta and run it for the stockholders, and that the Georgia road be required to give an account of its actings and doings in the premises. The bill alleges that the Georgia Railroad has made, or ought to have made, large profits out of the Macon & Augusta road, which profits it has not paid to the stockholders; that the complainant could run the road profitably if he had charge of it, and also, that Judge King promised, when the Georgia road took charge of the Macon & Augusta, that the stock of the latter should be consolidated with that of the former and consolidated shares issued to the stockholders of the Macon & Augusta. This Mr. King denies. We understand that a proposition was made at one time by the stockholders of the Macon & Augusta Railroad, in convention assembled, to the stockholders of the Georgia Railroad, also in convention, to consolidate the stock of the Macon & Augusta with that of the Georgia road, the stockholders of the former to receive stock of the latter in the proportion of two for three, but this proposition was not entertained by the Georgia Railroad Convention. M. K. Jesup was a member of the firm of George G. Hull & Co., the contractors by whom the Macon & Augusta Railroad was built.

"The two trustees under the first mortgage and one under the second mortgage having died, and the other trustee, Judge King, under the second mortgage, having resigned, it became necessary to appoint others to fill the vacancies. The directors yesterday took the proper steps in that direction. The trustees under the second mortgage (one or more) are designated by the Georgia Railroad directory and confirmed by the Judge of the Superior Court. Those under the first mortgage are appointed by the Judge. The directors appointed Judge W. M. Reese, of the board, trustee under the second mortgage, subject to the approval of the Superior Court Judge. Judge Reese will proceed at once to foreclose this mortgage, and offer the Macon & Augusta Railroad for sale."

The Macon & Augusta road is 78 miles long, from Camak, Ga., to Macon, and was built in the interest of the Georgia Company, which guaranteed $300,000 of the $400,000 first-mortgage bonds, and all of the $370,000 second-mortgage bonds. The Georgia Company has worked the road and paid interest on the bonds, though the working expenses have been nearly equal to the earnings, and in some years have exceeded them, leaving no surplus for interest. If there is to be a foreclosure, as spoken of above, it must be on the coupons paid by the Georgia Company and still held by it, as the bondholders have received their interest.

Memphis Branch.—This road is reported to have been sold to H. Blanchard, of Boston, for $125,000, and it is said that he will at once complete it to Cedartown, 30 miles from Rome. The road was sold some time since to satisfy the lien held by the State of Georgia. It has five miles of track, but has never been worked.

Michigan Air Line.—It will be remembered that this short road some time since passed under the control of the Grand Trunk, that company buying out Mr. Wm. Young, who owned nearly all the stock. The road is in operation from Ridgeway, Mich., on the Grand Trunk, west to Romeo, 16 miles. Arrangements have now been made to extend it from Romeo southwest to Pontiac, 20 miles, and the contract for the grading has been let to Robert Mitchell, of Grand Rapids, Mich., who is to finish his work by Nov. 15. It is said that a further extension is under consideration.

Montclair & Greenwood Lake.—A meeting of second-mortgage bondholders was held in New York, Sept. 5, at which it was voted to accept the plan of reorganization as adopted by the conference committee. Two or three bondholders refused to vote for the plan and threatened proceedings to enjoin the sale of the road.

Argument is to be heard by the Chancellor of New Jersey at Newark, Sept. 14, on the petition of certain second-mortgage bondholders, who charge that the decree of forclosure was obtained by collusion; that the first-mortgage bonds were not sold, but hypothecated and then bought in at nominal prices by parties who had plotted to secure control of the road. They ask to have the decree reopened, and also ask that an account of the disposition of the proceeds of Receiver's certificates issued may be ordered.

Newfoundland.—The government of Newfoundland has decided to offer a subsidy of $120,000 a year and a large grant of lands to any company which will build a railroad across the island from St. Johns, the chief town, to a point on St. George's Bay on the west coast. The distance is about 250 miles, and some of the land on the line is said to be very good, but much of the interior is uninhabited and almost unexplored. The railroad proposed would open up the island to settlement, and might, it is thought, be made part of a transatlantic line, steamers running to St. Johns and connecting there with the railroad to St. George's Bay, whence another steamer line would run to Pictou, connecting with the intercolonial.

New York, Lake Erie & Western.—The third rail having been completed as far as Binghamton, a new fast train has been put on the Albany & Susquehanna road between Albany and Binghamton. This connects with trains Nos. 3 and 12 on the Erie, and through cars are run between Albany and Hornellsville. This train is doubtless a preparation or foreshadowing of the Boston connection to be established by this route when the Boston, Hoosac Tunnel & Western road is finished.

Northern Pacific.—Heavy shipments are reported over this road of wheat from the Red River country. A large part of these shipments are made to Duluth and thence by steamer down the lakes.

Ohio & Mississippi.—A circular has been issued urging upon the second-mortgage bondholders and stockholders that the present is a favorable time to secure their interest in the property by united action to relieve the company from its embarassments. The circular is issued by the Reorganization Committee, and is approved by a number of large holders of securities. It also urges holders of stock and voting bonds to give their proxies for the coming election to the committee or members of it.

The New York *Times* of Sept. 12 says:

"The New York stockholders in the Ohio & Mississippi Railroad, which is in default, are making another effort to obtain possession of their property. Nine-tenths of the $20,000,000 capital stock are owned here. Early in the present (fiscal) year the Baltimore & Ohio interest captured the annual meeting by a sharp trick, and elected their own board of directors. The New Yorkers held another meeting and elected another board, and began legal proceedings to oust the Baltimore & Ohio people. A compromise was subsequently effected, however, the contest was withdrawn, a plan of reorganization was agreed upon, and a committee composed of directors of the road was appointed to carry it out. The New Yorkers have issued a circular in which they charge that the committee ignored their instructions and abandoned all effort to carry them out. They assert that this was due to the influence of the Baltimore & Ohio Railroad Company, exercised with a view to the continuance of their present control of the Ohio & Mississippi property. The circular continues: 'It is necessary that the stockholders and bondholders should clearly understand the influential position of the Baltimore & Ohio Railroad Company management. Their Vice-President and Manager is now the Receiver and Manager of the Ohio & Mississippi Railway Company, while, with limited exceptions, the board of directors is composed of their friends and nominees. In view of the intimate business relations that must always exist between two corporations, it is certainly desirable to cultivate the most friendly understanding between them, but it cannot be in the interest of the Ohio & Mississippi property that it should be, as it now is, under the control of the managers of the Baltimore & Ohio Railway, who have obtained the entire direction of its traffic and policy. Without questioning the ability and integrity of the present Receiver, it is evident that while he administers the affairs of the Ohio & Mississippi Company, the Baltimore & Ohio Railroad Company will be practically in possession of the Ohio & Mississippi Railway, without assuming any pecuniary responsibility whatever.' An appeal is made to the stockholders and bondholders to take steps to be represented at the annual meeting, which takes place on Oct. 10; that vacancies occurring in the board of directors be filled by New Yorkers; that the right of the proprietors to repeal the by-law providing for the periodical retirement of directors be tested, and, in the event of its proving legal, that the entire board of directors be elected, of which a majority shall be in New York and its vicinity; that no director be hereafter chosen who shall not have a *bona fide* interest in the stock of the company; that the earliest possible occasion be taken for securing the meetings of the board of directors in New York; or, if this prove impracticable on legal grounds, that the New York members of the board be constituted an Executive Committee, with full powers, and that a committee of second mortgage-bondholders and a similar committee of the stockholders be appointed to confer as to the best method of restoring the credit of the company. It is proposed to clear off the default on the first mortgage, amounting to $235,000, and those on the second, aggregating $560,000, and to permit a reconsideration of the Springfield purchase. Aside from the above sums, the only lien on the property is $600,000 floating debt. It is asserted that the road is earning $1,000,000 net per annum, with mortgage interest charges, apart from the Springfield Division, of only $750,000."

Ottumwa, Sigourney & Eastern.—This company has been organized to build a railroad from Cedar Rapids, Ia., south by west through Sigourney to Ottumwa, about 80 miles. It is a revival of an old project, and is now said to be in the interest of the Burlington, Cedar Rapids & Northern.

Pre-empting Pacific Railroad Lands.—A circular of instructions has been issued by the Commissioner of the General Land Office in accordance with the recent decision of the Secretary of the Interior in the Dudymott case, to the registers and receivers of United States district land offices. It provides for the filing of declaratory statements, for notice to the railroad companies, for contests over the rights of settlers to locate on the unsold land grants, and for a transmission of the record of all proceedings to the office in Washington. The circular concludes:

"For your information and guidance I subjoin the following list of companies whose grants are clearly under, or subject to, the terms of the Act of July 1, 1862, with the date of the completion of each road, as appears from the records of the department:

"Union Pacific Railroad, completed July 15, 1869.
"Kansas Pacific Railway, completed Oct. 19, 1872.
"Union Pacific, Central Branch, completed Jan. 20, 1872.
"Denver Pacific Railroad, completed May 2, 1872.
"Sioux City & Pacific, completed March 2, 1869.
"Central Pacific Railroad, completed July 15, 1869.
"Western Pacific Railroad, completed Jan. 21, 1870.

"Should application be made to fill for lands within the limits of grants other than those named above, with allegation that such lands are subject to the same or a like condition as imposed by the Act of July 1, 1862, you will transmit the application to this office for instructions."

Providence & Springfield.—Arrangements are being made to build a branch from Primrose, R. I., on this road, to Woonsocket, about 5 miles.

Rutland.—The Boston *Advertiser* of Sept. 4 says: "In answer to an inquiry in relation to the coupons upon the equipment bonds of the Rutland Railroad Company, due on Monday, the Treasurer reports that the directors have voted to dedicate the income of the road to the extinguishment of the floating debt of the company. No provision has been made for coupons now due."

There are $1,000,000 equipment bonds outstanding, on $500,000 of which interest at the rate of 8 per cent. per year was due Sept. 1. The road is leased to the Central

Vermont for 25 per cent. of the gross earnings, minimum rental being guaranteed at $258,000 a year. The annual interest charge on the funded debt is $179,000, and rental charges last year were $71,000.

San Francisco & North Pacific.—The track is now all laid on the Sonoma & Marin Branch from Petaluma, Cal., southward to San Rafael, 22 miles, and regular trains will begin to run shortly. The road has been under construction for three years past, and there is some difficult work upon it, including an expensive tunnel at the Puerto Suello. The company now owns the main line, from Donahue to Cloverdale, 56 miles; the Guerneville Branch, 16 miles, and the Sonoma & Marin Branch, 22 miles, making 94 miles in all.

South Carolina.—Argument in the matter of the application of certain second-mortgage bondholders for an injunction and the appointment of a receiver was begun before Judge Bond, of the United States Circuit Court, at Baltimore, Sept. 4. At the outset counsel for the company raised the question of jurisdiction, holding that the case must be heard in the South Carolina district, and that a postponement should be had until the regular term of the Court at Charleston or Columbia. Judge Bond, after hearing argument on this point, decided that he had authority to hear the case in Baltimore and the arguments proceeded.

On the following day applications were made by parties holding second-mortgage bonds as collateral to be admitted to the case. This was denied, as was also an application for postponement. On the two following days the arguments continued, several counsel for the applicants being heard. Leave was given for the filing of additional affidavits by the trustees under the first mortgage.

On Sept. 9 the case was postponed for a few days, on account of the illness of the Judge. A number of counsel are still to be heard, and it is thought that the case will occupy at least a week longer.

South Pacific Coast.—The San Francisco *Evening Post* thus describes the work which this company has been doing at the terminus of its road at Alameda, across the bay from San Francisco:

"A track has been made over the marsh from the ferry landing to Webster street bridge, some three-fourths of a mile distant, and a wagon road is also being made over the marsh alongside of a railroad track. The marsh is filled in for the roadway by earth taken from the creek by the dredgers, which have been and are constantly at work deepening the channel alongside the wharf and ferry slip. This pile is about three feet high. Two substantial bridges are made in this piece of roadway. At the ferry landing and wharf there are being constructed large and commodious sheds and depot buildings. The sheds are 40 feet wide by 360 feet long, and the building for offices, baggage and passenger rooms is 40 by 160 feet long. The wharf itself is about 1,000 feet in length, by 400 feet wide, and built in the most substantial manner. It has a frontage on the water of 800 feet. The ferry slip intended for the boats is similar to those at the foot of Market street now used by the ferry boats. This slip will be completed and ready for use in less than a week. In order to make these improvements a vast amount of dredging has been necessary, as by orders of Colonel Mendell the wharf and slip were placed within the line designated by him as a United States channel. The dredging was nearly all done by Captain Hackett, and the space dredged was 60 feet wide and over 2,000 feet long. The steamer Bay City is now running as a regular passenger boat in connection with the trains, and an electric light is being constructed on the steamer which will, it is said, light up the entire creek for half a mile ahead or the steamer, insuring safety as she proceeds. A wagon road is also being constructed from the wharf to Bird's Point, Alameda, in order to facilitate approach to the wharf. An artesian well 200 feet in depth affords an abundant supply of fresh water, and is very convenient. The cost of these improvements will approximate $800,000, and the work is all being done by white men, not a Chinaman being employed."

Spartanburg & Asheville.—The bridge over the Green River beyond the terminus at Pace's Gap, S. C., is nearly finished, and as soon as it is ready for the passage of trains tracklaying will be resumed toward Hendersonville, N. C.

The road reaches its present terminus at Pace's Gap by a grade of 237 feet to the mile. The grade is reduced somewhat on the numerous curves, but the total rise is 605 feet in three miles. The elevation at Pace's Gap is 2,250 feet above the sea.

Toledo & Ann Arbor.—There is some talk of the extension of this road from Ann Arbor, Mich., northward to Owosso, and probably further into the pine region of the state.

Utica, Ithaca & Elmira.—The progress of the extension from De Ruyter, N. Y., north to Cazenovia is delayed by a controversy with the Syracuse, Chenango & New York about the crossing of that road near Cazenovia. An agreement had been made providing for the crossing, but the Syracuse Company claims that its terms have not been observed, and has stationed a locomotive at the crossing to prevent the laying of the rails.

Wabash.—The Lafayette (Ind.) *Journal* says: "Business on the Wabash during the month of August assumed immense proportions. The business of August, 1877, was considered very large, but compared with the same month of this year was comparatively small. In 1877 the total number of cars passing through Lafayette was 22,086, of which 14,702 were loaded and 7,384 were empty. The total number this year in August was 27,064, of which 17,695 were loaded and 9,369 were empty, which gives a showing of 4,798 more cars passing through this year in August than in the same month last year."

Waynesville, Harveysburg & Wilmington.—This company has been organized in Ohio to build a road from Waynesville, O., southeast to Wilmington, about 10 miles.

Western Union Telegraph.—The quarterly statement of this company is as follows for the quarter ending Sept. 3:

Surplus, July 1	$369,083.56
Net earnings for quarter, partly estimated	1,001,364.73
Total	$1,370,448.29
Interest and sinking funds	$129,000
New construction, etc	50,000
	179,000.00
Surplus	$1,191,448.28

From this the usual quarterly dividend of 1½ per cent. has been declared, which will be $525,936, leaving a surplus of $655,512.29 to the next quarter.

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Atlantic, Mississippi & Ohio.

This company owns a line from Norfolk, Va., to Bristol, 408 miles, with branches from Petersburg to City Point, 10 miles, and from Glade Springs to Salt Works, 10 miles, 428 miles in all. The present company was formed in 1870 by the consolidation of the Norfolk & Petersburg, the South Side (Petersburg to Lynchburg) and the Virginia & Tennessee (Lynchburg to Bristol) companies. It is now operated by C. L. Perkins and Henry Fink, Receivers in a suit to foreclose the consolidated mortgage, and their latest report to the Court covers the year ending June 30, 1878.

The equipment consists of 84 engines; 27 passenger, 2 sleeping, 13 baggage and express and 4 postal cars; 452 box, 165 stock, 278 flat and 63 conductors' cars; 1 pay and 70 ditching cars. Two engines were built and four broken up during the year; 20 box and 20 stock cars, built in the company's shops, were added to the equipment.

The work done for the year was as follows:

Train mileage:	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passenger	438,971	.....	.....	...
Freight	801,685	.....	.....	...
Total	1,240,656	.....	.....	...
Passengers carried	149,577	101,641	D. 12,064	7.5
Passenger mileage	9,470,228	10,384,671	D. 914.443	8.8
Tons freight carried	340,806	334,306	I. 6,560	2.0
Tonnage mileage	70,797,576	64,499,228	I. 6,298,348	9.8
Av. train load:				
Passengers, number	21.57	.....	.....	...
Freight, tons	88.31	.....	.....	...
Av. receipt:				
Per passenger per mile	3.55 cts.	.....	.....	...
Per ton per mile	1.86 "	.....	.....	...

The average rate for local passengers was 3.76 cts.; through, 3.01 cts. per mile; for local freight, 2.64 cts., and for through, 1.29 cts. per ton per mile. On east-bound through freight the average rate was only 0.97 ct. per ton per mile, and on west-bound, 1.70 cts. Cotton furnished 54,999 tons; tobacco, 28,145 tons; wheat, 17,061 tons, and cattle, 16,217 tons. Cotton carried to Norfolk was 217,236 bales.

The earnings and expenses per train mile were as follows, in cents:

	Earnings.	Expenses.	Net earn.
Passenger train mile	102.79	86.41	16.38
Freight train mile	165.96	114.04	51.92
Average, all trains	143.60	104.37	39.24

Some statistics of the movement of equipment for the year were as follows:

	N. & P. and South Side Divs.	Va. & Tenn. Div.
Locomotive mileage	545,813	887,212
Average per engine	16,053	17,744
Cost per mile run	19.32 cts.	21.00 cts.
Estimated gross tons hauled one mile	129,555,739	177,897,201
Estimated net tons hauled one mile	37,228,606	39,299,266
Mileage of passenger train cars	595,910	1,416,225
Mileage of tonnage cars	5,089,799	6,290,644
Mileage of material cars	842,415	582,985

Foreign cars made 1,171,976 on the Norfolk & Petersburg and South Side, and 1,351,035 miles on the Virginia & Tennessee Division. The company's freight cars made 2,347,964 miles on foreign roads. The locomotive mileage for the whole road was: Passenger trains, 438,971; tonnage trains, 801,685; material trains, 96,969; switching, 95,400; total, 1,433,025 miles.

The earnings for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passenger trains	$447,202.96	.....	.....	...
Tonnage trans	1,321,472.96	.....	.....	...
Miscellaneous sources	13,034.10	.....	.....	...
Total	$1,781,710.02	$1,740,838.62	I. $40,871.40	2.3
Working expenses	1,074,745.36	1,040,398.60	I. 34,346.76	3.3
Renewals extraordinary exps	220,075.45	221,247.53	D. 1,172.08	0.5
Total	$1,294,820.81	$1,261,646.13	I. $33,174.68	2.6
Net earnings	$486,889.21	$479,192.49	I. $7,696.72	1.6
Gross earnings per mile	4,162.88	4,067.38	I. 95.50	2.3
Net earnings per mile	1,137.59	1,119.61	I. 17.98	1.6
Per cent. working expenses	60.32	59.76	I. 0.56	0.9
Per cent. all exps	72.67	72.47	I. 0.20	0.3

There was expended last year also $56,755.49 for further construction, leaving the net revenue $430,133.72. The Receivers' account for the year was:

Balance, June 30, 1877	$50,951.32
Received from all sources	1,880,854.57
Total	$1,931,805.89
Expended	1,872,969.38
Balance, June 30, 1878	$58,836.51

The payments included $395,235.98 for interest on bonds—that is on the divisional bonds prior to the consolidated mortgage. The Receivers' liabilities and resources at the close of the year were as follows:

Liabilities:	
Receivers' certificates, collateral loans	$143,800.00
" " renewals, new rails, etc	98,508.88
Pay-rolls, balances, open accounts	152,196.36
Interest on funded debt, including July 1	191,567.06
Total	$586,072.30
Cash on hand	$58,836.51
Accounts and balances due	52,884.03
Old rails on hand	41,325.00
Supplies	222,235.98
Agents' balances	18,480.16
	$393,761.68
Excess of liabilities, June 30, 1878	$192,310.62

The Receivers hold $97,800 divisional and $354,000 consolidated bonds; $212,800 divisional and $120,000 consolidated bonds are pledged as collateral for loans. There are deposited with the Court $574,002.68 divisional bonds and $9,059,000 consolidated bonds, unissued.

During the year the indebtedness of the company was decreased $85,338.77. Owing to the extra expenses caused by the great flood in November, it was not possible to complete the payment of the back pay-rolls, and $78,635.37 is still unpaid on this account. Holders of $346,000 Norfolk & Petersburg bonds have extended them, as permitted by order of the Court, leaving $17,000 not extended.

During the year 5,090 tons steel rails, 246,122 new ties and 65,853 cubic yards of ballast have been used on the road. There are now in the main track 150.6 miles of steel 27.8 miles of old ∩ rails, 42 miles of rerolled and 187.6 miles of English fish-bar rails. Much work has been done in raising the road and protecting it at exposed points. Bridge renewals were large, owing to the flood; 525 ft. iron, 1,296 composite, 764 ft. iron plate girders and 970 ft. pile bridges were built and much new masonry. The James River bridge at Lynchburg was replaced by iron, and the New River bridge is now being replaced in the same way. The November floods destroyed over 2,000 ft. of bridging and three miles of track.

Several plans are on foot for developing the coal and iron deposits on the line of the Virginia & Tennessee Division, from which much traffic is hoped for hereafter.

Complaint is made of the inadequate rates of pay for carrying the mails, though a fast train has been run over the road, chiefly at the request of the Post Office Department.

Louisville, Cincinnati & Lexington.

This company owns and works the following lines:

	Miles.
Louisville, Ky., to Lexington	93.70
Lexington Junction to Newport	81.00
Total owned	174.70
Newport & Cincinnati Bridge, leased	0.96
Louisville Railway Transfer	4.13
Elizabeth, Lexington & Big Sandy, leased	33.70
	38.79
Total worked	13.49

The statements in the report cover the line owned, only the net results from the leased properties being given. The present company acquired possession through a foreclosure sale, Oct. 1, 1877, and its first annual report covers the nine months from Oct. 1, 1877, to June 30, 1878.

The equipment consists of 31 engines; 24 passenger, 9 baggage and 6 express cars; 188 box, 95 stock box, 25 stock rack, 105 platform, 20 gondola, 10 caboose and 1 yard car; 1 pay, 28 road, 8 boarding, 1 wrecking, 1 derrick, 53 dumping and 58 hand cars.

The general account is as follows:

Preferred stock		$1,374,762.08
Common stock		496,011.56
Total stock ($10,708 per mile)		$1,870,773.64
Funded debt ($19,321 per mile)		3,375,300.00
Purchase notes held by Chancery Court		428,167.32
Accounts, balances, July coupons, etc		236,071.34
Balance of income account		111,447.67
Total ($35,469 per mile)		6,021,759.99
Cost of road ($34,043 per mile)	$5,772,640.32	
Cash, balances, supplies, etc	249,119.67	
		6,021,759.99

The funded debt consists of $100,000 Louisville city bonds assumed; $3,000,000 bonds issued under the Green mortgage, subject to which the road was sold, and $275,300 bonds issued by the new company. The authorized issue of these new bonds is $1,000,000, and from their sale the purchase notes are to be provided for. The purchase notes are for $25,186.31 each and are payable at intervals of three months. The Louisville city bonds bear 6 per cent., the others 7 per cent. interest.

The earnings and expenses for the nine months were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers	$273,339.82	$289,892.16	D. $16,552.34	5.7
Freight	370,720.72	419,030.19	D. 48,309.47	11.5
Express and mail	42,667.53	38,870.01	I. 3,797.52	9.8
Miscellaneous	3,603.27	3,890.90	D. 287.63	7.4
Total	$690,331.34	$751,683.26	D. $61,351.92	8.2
Working expenses	480,950.25	554,054.01	D. 73,103.76	13.2
Taxes and rentals	14,266.97	26,318.84	D. 12,051.87	45.8
Total	$495,217.22	$580,372.85	D. 85,155 63	14.7
Net earnings	$195,114.12	$171,310.41	I. 23,803.71	13.9
Gross earn. per m	3,951.52	4,302.71	D. 351.19	8.2
Net " "	1,116.85	980.60	I. 136.25	13.9
Per cent. working expenses	69.67	73.71	D. 4.04	5.5
Per cent. all exps	71.74	77.21	D. 5.47	7.1

The income account was as follows:

Balance, Oct. 1, 1877		$127,481.59
Transportation earnings		690,331.34
Interest on daily cash balances		3,402.62
Total		$821,215.55
Working expenses	$480,950.25	
Rentals of Cincinnati depot	$15,608.98	
Taxes	9,212.70	
Loss on Big Sandy lease	2,152.54	
Total	$26,974.22	
Less profit on other leases	12,707.25	
	14,266.97	
Interest on bonds and purchase notes	173,000.66	
Discount on $275,300 bonds sold	41,550.00	
		709,767.88
Balance, June 30		$111,447.67

Thé statement for the full year ending June 30 is as follows:

	1877-78.	1876-77.	1875-76.
Gross earnings	$978,083.23	$1,049,368.91	$1,011,687.60
Exps., taxes and rentals	683,922.77	792,658.66	805,821.07
Net earnings	$294,160.46	$256,710.25	$205,866.53

The work done for the nine months was as follows:

Train mileage:	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passenger	270,530	.....	.....	....
Freight	179,124	.....	.....	....
Total	449,654	.....	.....	....
Locomotive mileage	693,085	682,948	I. 10,137	1.5
Passenger-train car mileage	1,254,112	1,173,278	I. 80,834	6.9
Freight car mileage	3,431,558	3,228,773	I. 202,785	6.3
Road car mileage	275,095	327,406	D. 52,311	15.9
Passengers carried	229,274	242,958	D. 13,684	5.6
Passenger mileage	8,995,497	9,799,730	D. 804,233	8.2
Tons freight carried	227,078	215,210	I. 11,868	5.5
Tonnage mileage	19,707,531	18,473,440	I. 1,234,091	6.7
Av. train load:				
Passengers, No	33.25	.....	.....	....
Freight, tons	110.04	.....	.....	....
Receipt per pass. per mile	3.038 cts.	2.958 cts.	I. 0.080 ct.	2.7
Net per pass. per mile	0.490 "	.....	.....	....
Receipt per ton per mile	1.881 "	2.214 cts.	D. 0.333 ct.	15.0
Net per ton per mile	0.474 "	.....	.....	....

The average rate on through freight was 1.259 cents per ton per mile; local, 3.197 cents. The average earnings per train mile were 159.94 cents; expenses, 109.01 cents; net, 50.93 cents. Locomotive service cost 20.84 cents per mile run.

There was an increase in local but a decrease in through passenger business. Local freight showed a decrease in tonnage, while through freight was larger in bulk, but carried at lower rates, showing a decrease in revenue.

There were used in renewals 89,631 new ties, 1,040¾ tons new iron and 726 tons new steel rails; 1,674 tons steel have been contracted for, and by December the track from Louisville to La Grange, 26 miles, will be all steel. The road-bed on the Cincinnati line has been much improved. The equipment has been well maintained.

The earnings of the road have been sufficient to meet its interest liabilities in spite of the decrease in business and in freight rates. It is probable that an arrangement will be made by which the city of Louisville will assume payment of the interest on the $100,000 bonds, in consideration of the removal of the railroad track from Jefferson street. Negotiations are pending for modified leases of the Louisville Transfer and the Newport & Cincinnati Bridge.